Test Report

Verified code: 989164

Report No.: E20230331478001-5

Customer:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Sample Name:	Hub M3
Sample Model:	HM-G01E
Receive Sample Date:	Aug.02,2023
Test Date:	Nov.16,2023 ~ Dec.06,2023
Reference Document:	ETSI EN 300 328 V2.2.2 (2019-07)
Test Result:	Pass

Prepared by: Chen Xiaocong Reviewed by: Jiang Tao Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2023-12-29

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2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

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5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20230331478001-5	Original Issue	2023-12-18

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1. TEST RESULT SUMMARY

Test Item	Test mode	Test Requirement	Test Method	Class / Severity	Test Result
1. Transmitter Part					
RF Output Power	Mode 1	ETSI EN300 328 V2.2.2 4.3.2.2	ETSI EN300 328 V2.2.2/5.4.2.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.2	PASS
Power Spectral Density	Mode 1	ETSI EN300 328 V2.2.2/4.3.2.3	ETSI EN300 328 V2.2.2/5.4.3.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.3	PASS
Duty Cycle, Tx-sequence, Tx-gap	Mode 1	ETSI EN300 328 V2.2.2/4.3.2.4	ETSI EN300 328 V2.2.2/5.4.2.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.4	N/A
Medium Utilisation (MU) factor	Mode 1	ETSI EN300 328 V2.2.2/ 4.3.2.5	ETSI EN300 328 V2.2.2/5.4.2.2	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.5	N/A
Adaptivity	Mode 3	ETSI EN300 328 V2.2.2/ 4.3.2.6	ETSI EN300 328 V2.2.2/5.4.6.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.6	PASS
Occupied Channel Bandwidth	Mode 1	ETSI EN300 328 V2.2.2/ 4.3.2.7	ETSI EN300 328 V2.2.2/5.4.7.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.7	PASS
Transmitter unwanted emissions in the out-of-band domain	Mode 1	ETSI EN300 328 V2.2.2/ 4.3.2.8	ETSI EN300 328 V2.2.2/5.4.8.2.1	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.8	PASS
Transmitter unwanted emissions in the spurious domain	Mode 1	ETSI EN300 328 V2.2.2/ 4.3.2.9	ETSI EN300 328 V2.2.2/5.4.9.2.2	Meet requirements: ETSI EN300 328 V2.2.2/4.3.2.9	PASS
2. Receiver Part					
Receiver spurious emissions	Mode 2	ETSI EN300 328 V2.2.2/ 4.3.2.10	ETSI EN300 328 V2.2.2/5.4.10.2.2	Meet requirements: ETSI EN300 328 V2.2.2/ 4.3.2.10	PASS
Receiver Blocking	Mode 3	ETSI EN300 328 V2.2.2/ 4.3.2.11	ETSI EN300 328 V2.2.2/5.4.11.2.1	Meet requirements: ETSI EN300 328 V2.2.2/ 4.3.2.11	PASS

Note:
1. N/A = Not Applicable. It's apply to non-Adaptivity equipment or to adaptive FHSS equipment operating in a non-adaptive mode., the EUT is a adaptive equipment not operating in a non-adaptive mode, so it is not applied.

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT INFORMATION

Name:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EUT

Product Name:	Hub M3
Product Model:	HM-G01E
Adding Model:	HM-G01D
Models Difference:	The model NO. HM-G01E & HM-G01D have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical, except sales area and packaging are different.
Trade Name:	Aqara
Power Supply:	DC 5V/2A or PoE input 48V/0.27A
Frequency Band:	2412MHz - 2472MHz for 802.11b/g/n HT20 2422MHz - 2462MHz for 802.11n HT40
Modulation Type:	DSSS for 802.11b mode OFDM for 802.11g mode OFDM for 802.11n mode
Antenna Specification:	PIFA antenna with 0dBi gain (Max)
Temperature Range:	-10 ℃ ~ 50 ℃
Hardware Version:	V2.0.5_1060
Software Version:	T0
Sample submitting way:	■Provided by customer □Sampling
Sample No:	E20230331478001-0001, E20230331478001-0003, E20230331478001-0004
Note 1:	The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.
Note 2:	All the tests were performed on the model HM-G01E.

2.4 TEST MODE

Mode No.	Description of the modes
1	2.4GHz Wi-Fi TX mode
2	2.4GHz Wi-Fi RX mode
3	2.4GHz Wi-Fi Work Normal mode

2.5 FREQUENCY BAND AND THE TEST FREQUENCY

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
***1**	2412	5	2432	9	2452	***13**	2472
2	2417	***6**	2437	10	2457	---	---
***3**	2422	***7**	2442	***11**	2462	---	---
4	2427	8	2447	12	2467	---	---

Note：

For IEEE 802.11b,IEEE 802.11g , IEEE 802.11n HT20, test frequency is the lowest channel: channel 1(2412MHz),middle channel: channel 7(2442MHz) and highest channel: channel 13(2472MHz).

For IEEE 802.11n HT40,test frequency is the lowest channel: channel 3(2422MHz),middle channel: channel 7(2442MHz) and highest channel: channel 11(2462MHz).

2.6 DESCRIPTION OF ADAPTIVE EQUIPMENT

The type of the equipment	□ FHSS	☑ Non-FHSS		
Adaptive / non-adaptive equipment	□ Non-adaptive Equipment	☑ adaptive Equipment without the possibility to switch to a non-adaptive mode	□ adaptive Equipment which can also operate in a non-adaptive mode	
The equipment has an implemented	□ Frame Based equipment	☑ Load Based equipment	□ non-LBT based DAA mechanism	□ other
Device Class	☑ WIFI	□ Bluetooth Low Energy (5.0)	□ Bluetooth EDR/BR (5.0)	
Wi-Fi Channel Bandwidth	☑ 20MHz	☑ 40MHz	□ 80MHz	□ 160MHz
Antenna Gain	□ Antenna1 dBi	□ Antenna 2 dBi	□ Antenna 3 dBi	☑ Antenna 4 0 dBi
	□ Antenna 5			
Beamforming Gain	□ Yes, dBi	☑ No		
Extreme operating conditions	☑ Operating temperature range:	☑ Min -10℃	☑ Max +50 ℃	
Blocking	☑ PER	□ The manufacturer may declare alternative performance criteria		
Geo-location capability supported by the equipment	□ Yes	☑ No		

The EUT is Receiver Category 1 equipment.

3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
P.C.:	518110
Tel :	0755-61180008
Fax:	0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China	CNAS(L0446)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3.3 MEASUREMENTS UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI EN TR 100 028-1 (i.15) and ETSI EN 100 028-2 (i 8):

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz～200MHz	4.0dB
		200MHz～1000MHz	4.1dB
		1GHz～18GHz	4.9dB
	Vertical	30MHz～200MHz	3.9dB
		200MHz～1000MHz	4.2dB
		1GHz～18GHz	5.0dB

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.40 dB
Unwanted emission, conducted	0.68 dB
Humidity	6.0 %
Temperature	2.0℃

This uncertainty represents an expanded uncertainty expressed at approximately the 95%.
This uncertainty represents an expanded uncertainty factor of *k*=2.

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4. EQUIPMENT AND TOOLS USED DURING TEST

4.1 TEST EQUIPMENT AND TOOLS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Occupied channel bandwidth& Transmitter unwanted emissions in the out-of-band domain & Power Spectral Density & RF Output Power				
Automatic control unit	TONSCEND	JS0806-2	2018060317	2024-08-04
Programmable constant temperature and humidity test chamber	FC	FPHC-23AW-40	FD202306015	2024-09-10
Spectrum Analyzer	R&S	FSV30	104381	2024-10-13
BT/Wi-Fi System	tonscend	JS1120-3		
Transmitter unwanted emissions in the spurious domain & Receiver spurious emissions				
Bi-log Antenna	Schwarzbeck	VULB9163	01279	2024-03-05
Horn Antenna	Schwarzbeck	BBHA9120D	02499	2024-08-26
Amplifier	Tonscend	TAP037030	AP20E8060081	2024-04-16
Amplifier	Tonscend	TAP01018048	AP20E8060076	2024-04-16
Amplifier	Tonscend	TAP9E6343	AP20E806065	2024-04-16
Spectrum Analyzer	KEYSIGHT	N9010A	MY55370330	2024-09-08
Spectrum Analyzer	R&S	FSV3044	101184	2024-08-11
Test S/W	tonscend	JS36-RSE/5.0.0.1		
Adaptivity				
Spectrum Analyzer	R&S	FSV30	104381	2024-10-13
Vector Signal Generator	Agilent	N5182A	MY5014870	2024-06-09
Signal Generator	KEYSIGHT	N5173B	MY60403029	2024-05-15
Adjustable attenuator	SHX	GKTS-2-99-18-A1-B	20113001	2024-10-12
Simultaneous sampling DAQ	TONSCEND	JS0806-2	2018060317	2024-08-04
BT/Wi-Fi System	tonscend	JS1120-3		
Receiver Blocking				
Signal Generator	R&S	SMA100A	1406.6000K03-182190-G2	2024-10-13
Wideband radio Communication Tester	R&S	CMW500	144611-nC	2024-04-16
BT/Wi-Fi System	tonscend	JS1120-3		

Note: The calibration interval of the above test instruments is 12 months.

4.2 LOCAL SUPPORTIVE INSTRUMENTS

Name of equipment	Manufacturer	Model	Serial number	Note
Notebook	DELL	Latitude3420	4KBCGL3	/
Test board	/	/	/	/
Adapter	Jian Aohai	A70-050200U-EU1	/	/

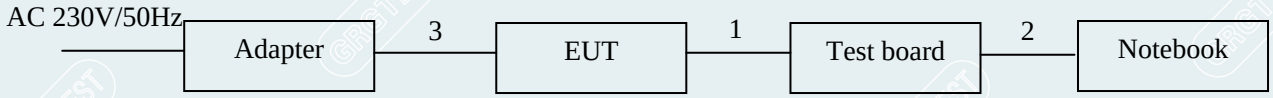
No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	Serial cable	1	No	0	0.3m
2	USB-MINI cable	1	Yes	0	1.0m
3	USB-C cable	1	Yes	0	0.8m
4	RJ45 cable	1	No	0	1.5m

Note: (1) The notebook is just used to produce fixed frequency transmitting.

4.3 CONFIGURATION OF SYSTEM UNDER TEST

For Occupied channel bandwidth& Transmitter unwanted emissions in the out-of-band domain & Power Spectral Density & RF Output Power & Receiver Blocking

For Transmitter unwanted emissions in the spurious domain & Receiver spurious emissions



4.4 TEST SOFTWARE

Software version	Test level
QCOM_V1.0	IEEE 802.11b: 42 IEEE 802.11g: 52 IEEE 802.11n HT20: 52 IEEE 802.11n HT40: 52

5. RADIO TECHNICAL REQUIREMENT SPECIFICATION

5.1 RF OUTPUT POWER

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.2

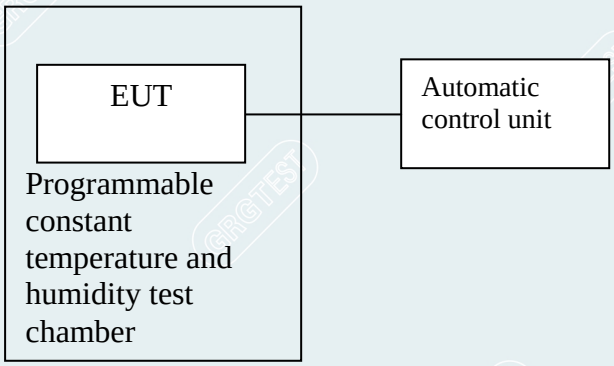
Test Method: ETSI EN300 328 V2.2.2/5.4.2.2.1

5.1.1 LIMIT

The RF output power for non-FHSS equipment shall be equal to or less than 20 dBm.

5.1.2 TEST CONFIGURATION

Conducted measurement:



5.1.3 TEST PROCEDURES

Test procedure:	Test procedure is according to Clause 5.4.2.2.1 of ETSI EN 300 328 V2.2.2
Test frequency:	2412MHz, 2442MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2442MHz, 2462MHz for IEEE 802.11n HT40
Test condition:	Normal and extreme test conditions.

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5.1.4 TEST RESULTS

Test environment:	Normal condition:	24.1℃/39%RH/101.0kPa		
Extreme test conditions:	Minimum Temp:	-10℃	Test Voltage:	DC 5V
	Maximum Temp:	+50℃		
Test Engineer:	Huang Tianmei			
Test Date:	2023-11-16			

Test Condition	Test Mode	Antenna	Frequency [MHz]	EIRP[dBm]	Limit[dBm]	Verdict
NTNV	IEEE 802.11b	Ant4	2412	17.34	20	PASS
		Ant4	2442	17.05	20	PASS
		Ant4	2472	16.61	20	PASS
	IEEE 802.11g	Ant4	2412	16.81	20	PASS
		Ant4	2442	16.66	20	PASS
		Ant4	2472	16.84	20	PASS
	IEEE 802.11n HT20	Ant4	2412	17.26	20	PASS
		Ant4	2442	16.85	20	PASS
		Ant4	2472	16.46	20	PASS
	IEEE 802.11n HT40	Ant4	2422	17.23	20	PASS
		Ant4	2442	17.03	20	PASS
		Ant4	2462	16.82	20	PASS
LTNV	IEEE 802.11b	Ant4	2412	17.38	20	PASS
		Ant4	2442	17.14	20	PASS
		Ant4	2472	16.70	20	PASS
	IEEE 802.11g	Ant4	2412	16.82	20	PASS
		Ant4	2442	16.74	20	PASS
		Ant4	2472	16.86	20	PASS
	IEEE 802.11n HT20	Ant4	2412	17.28	20	PASS
		Ant4	2442	16.89	20	PASS
		Ant4	2472	16.51	20	PASS
	IEEE 802.11n HT40	Ant4	2422	17.24	20	PASS
		Ant4	2442	17.07	20	PASS
		Ant4	2462	16.85	20	PASS
HTNV	IEEE 802.11b	Ant4	2412	17.31	20	PASS
		Ant4	2442	17.00	20	PASS
		Ant4	2472	16.57	20	PASS
	IEEE 802.11g	Ant4	2412	16.79	20	PASS
		Ant4	2442	16.60	20	PASS
		Ant4	2472	16.84	20	PASS
	IEEE 802.11n HT20	Ant4	2412	17.23	20	PASS
		Ant4	2442	16.84	20	PASS
		Ant4	2472	16.45	20	PASS
	IEEE 802.11n HT40	Ant4	2422	17.23	20	PASS
		Ant4	2442	17.03	20	PASS
		Ant4	2462	16.81	20	PASS

5.2 POWER SPECTRAL DENSITY

Test Requirement: ETSI EN300 328 V2.2.2/4.3.2.3

Test Method: ETSI EN300 328 V2.2.2/5.4.3.2.1

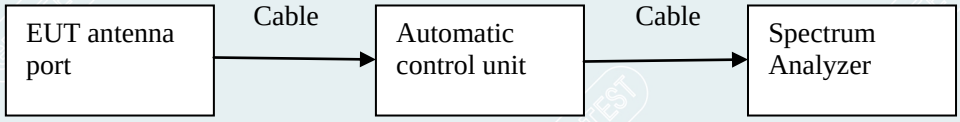
5.2.1 LIMIT

This requirement applies to all types of equipment using wide band modulations other than FHSS.

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10 dBm per MHz.

5.2.2 TEST CONFIGURATION

Conducted measurement:



5.2.3 TEST PROCEDURES

Test condition:	Normal test conditions
Test frequency:	2412MHz, 2442MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2442MHz, 2462MHz for IEEE 802.11n HT40
Test procedure:	Test procedure is according to Clause 5.4.3.2.1 of ETSI EN 300 328 V2.2.2
Remark:	/

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5.2.4 TEST RESULTS

Test environment: Normal condition:

24.1℃/39%RH/101.0kPa

Test Engineer: Huang Tianmei

Test Date: 2023-11-16

Test Voltage: DC 5V

Test Mode	Antenna	Freq[MHz]	EIRP PSD[dBm/MHz]	Limit[dBm/MHz]	Verdict
IEEE 802.11b	Ant4	2412	8.59	10	PASS
		2442	8.18	10	PASS
		2472	7.68	10	PASS
IEEE 802.11g	Ant4	2412	5.48	10	PASS
		2442	5.29	10	PASS
		2472	5.43	10	PASS
IEEE 802.11n HT20	Ant4	2412	5.77	10	PASS
		2442	5.26	10	PASS
		2472	4.75	10	PASS
IEEE 802.11n HT40	Ant4	2422	2.80	10	PASS
		2442	2.36	10	PASS
		2462	2.69	10	PASS

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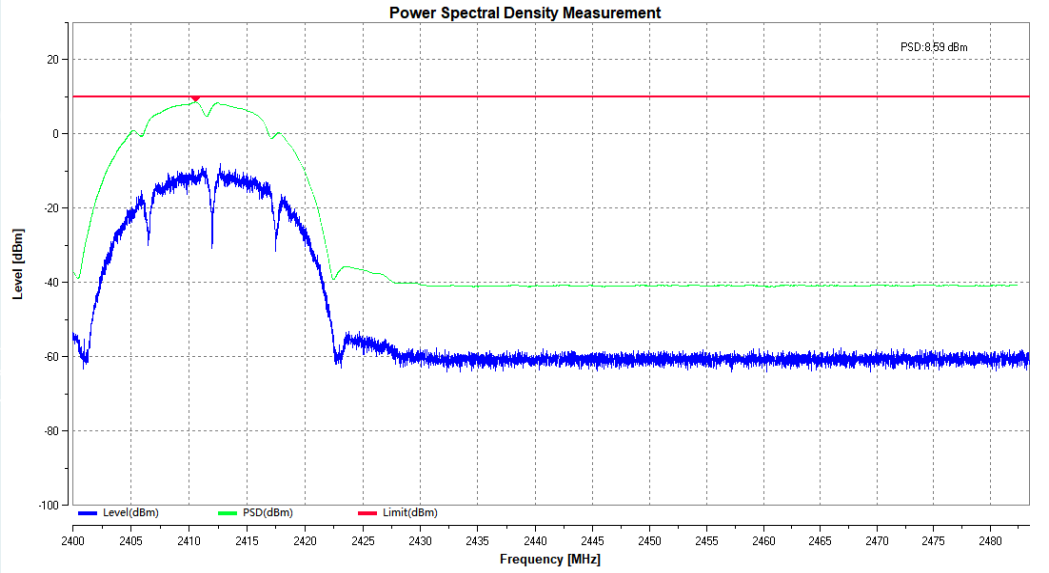
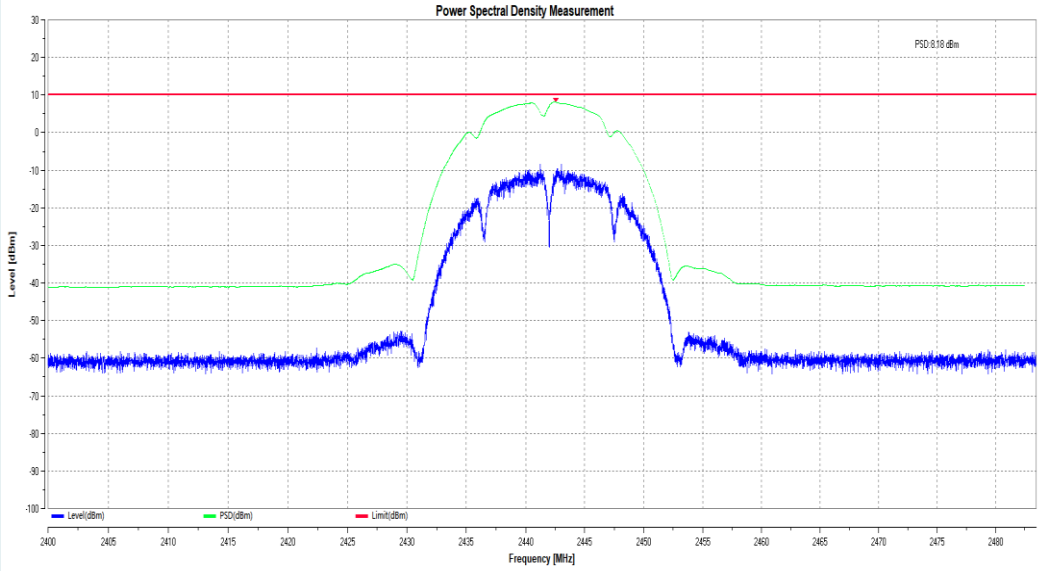
Test Graphs

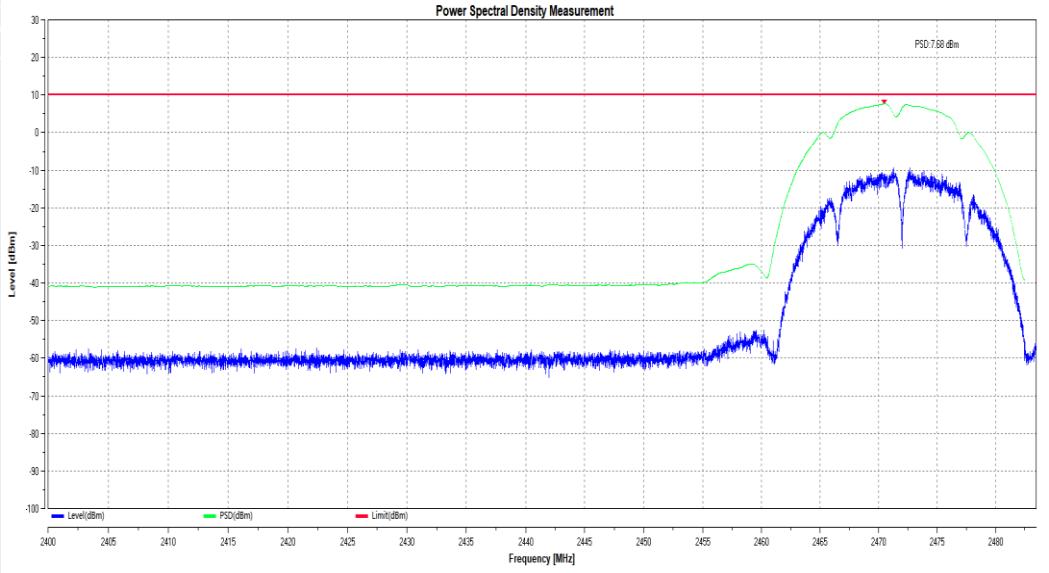
IEEE 802.11b_Ant4_2412MHz



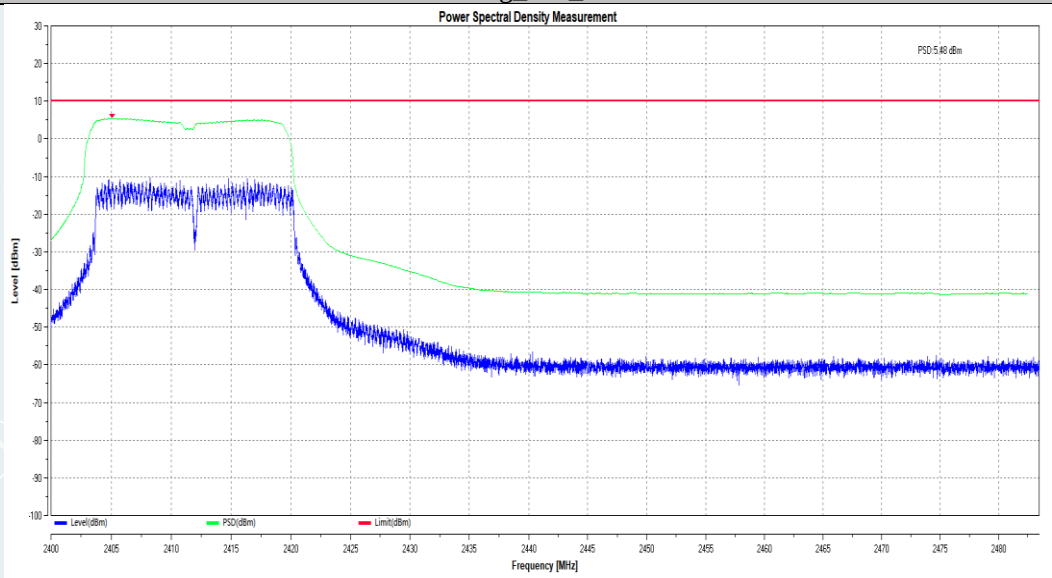
IEEE 802.11b_Ant4_2442MHz



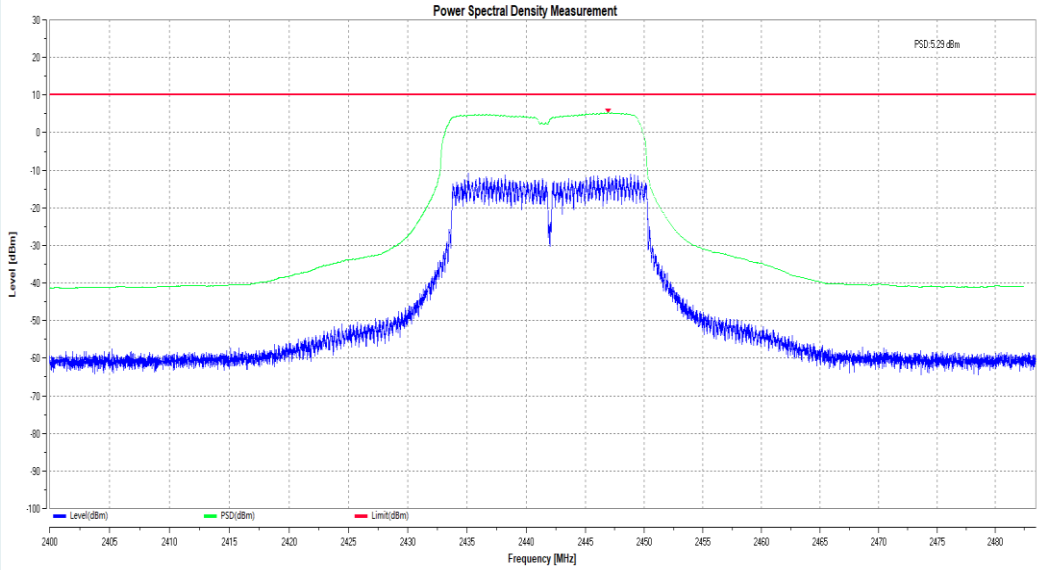
IEEE 802.11b_Ant4_2472MHz



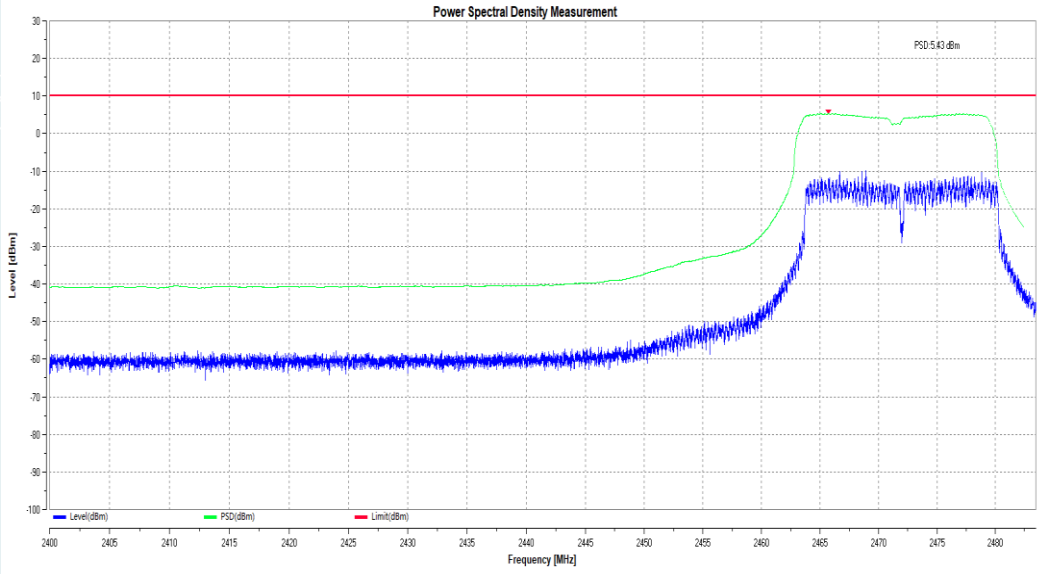
IEEE 802.11g_Ant_2412MHz



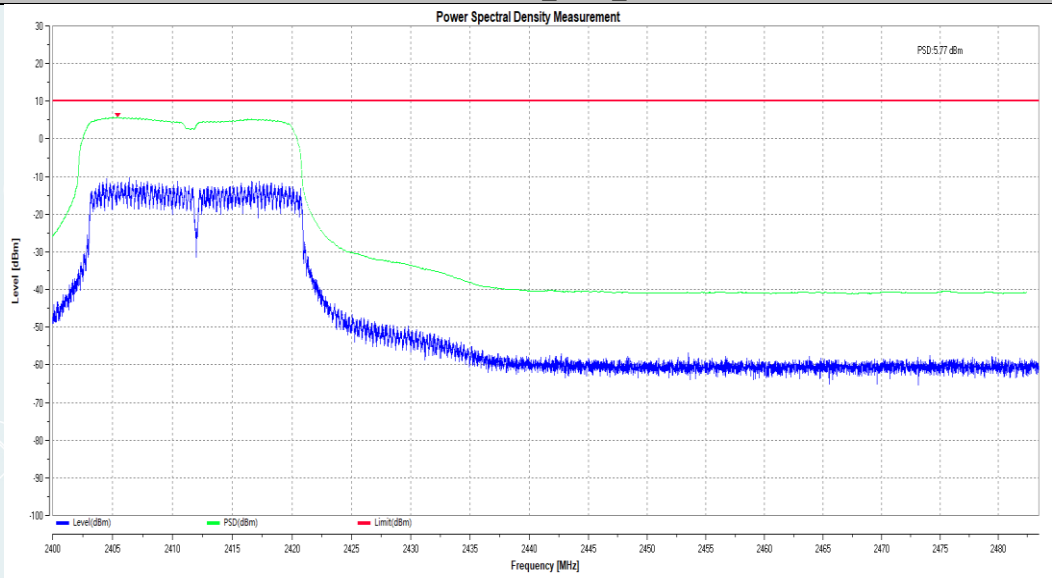
IEEE 802.11g_Ant4_2442MHz



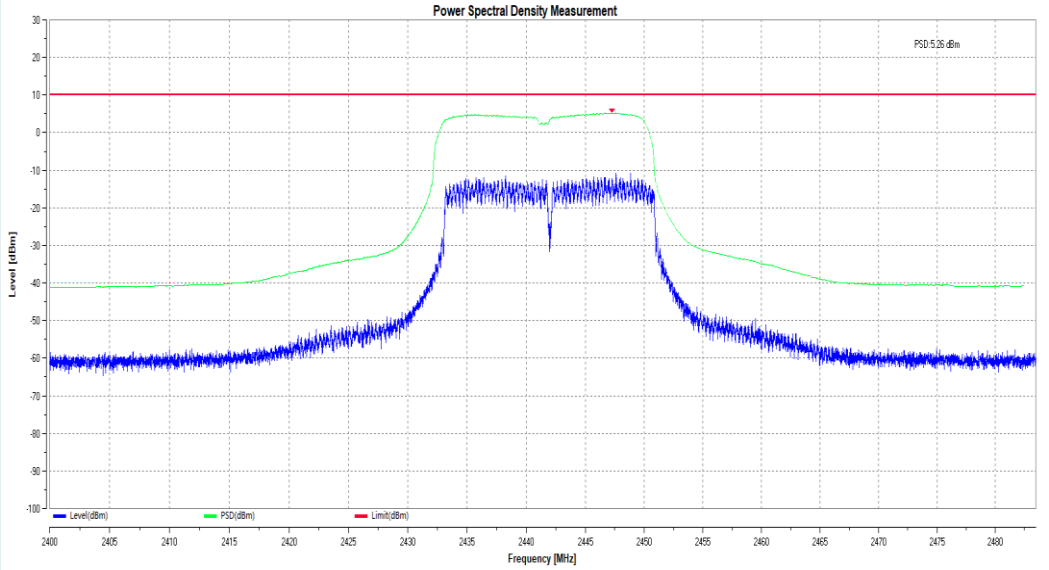
IEEE 802.11g_Ant4_2472MHz



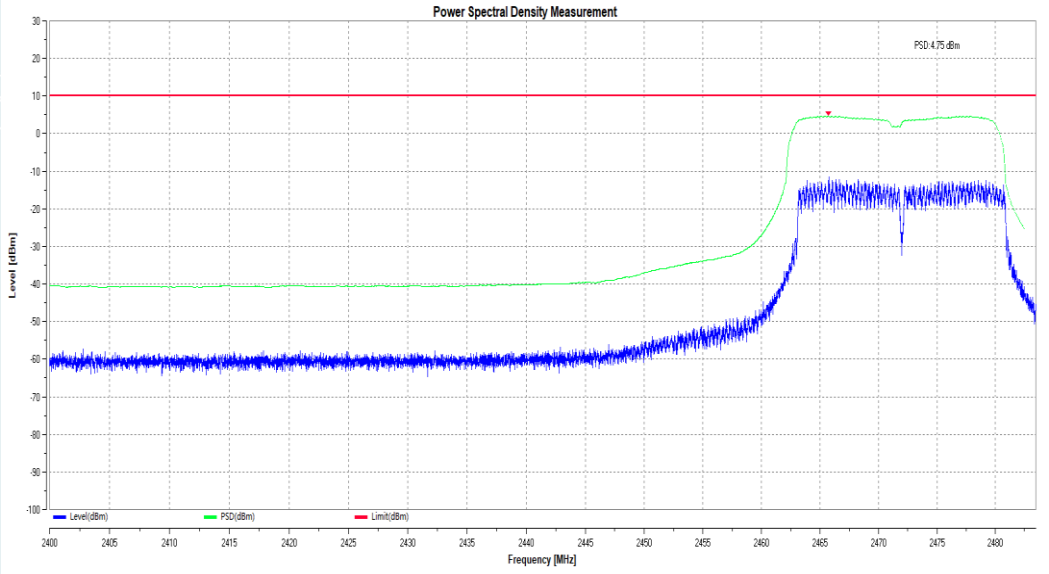
IEEE 802.11n HT20_Ant4_2412MHz



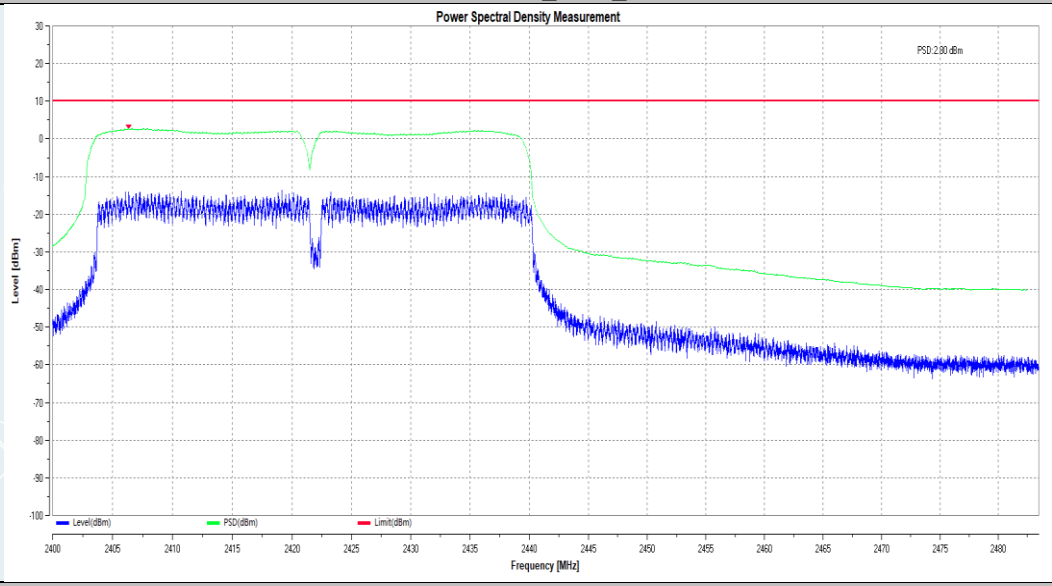
IEEE 802.11n HT20_Ant4_2442MHz



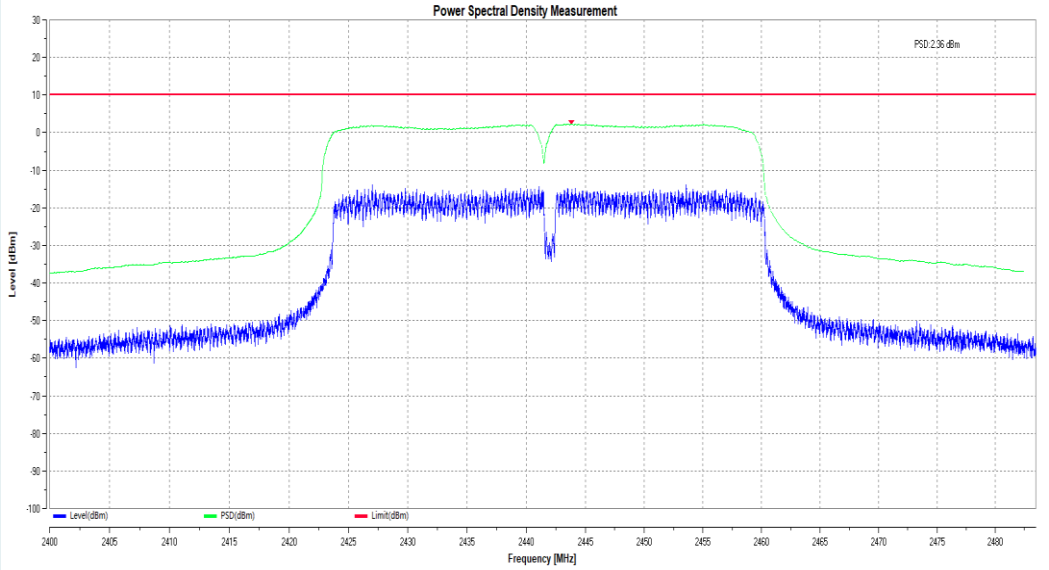
IEEE 802.11n HT20_Ant4_2472MHz



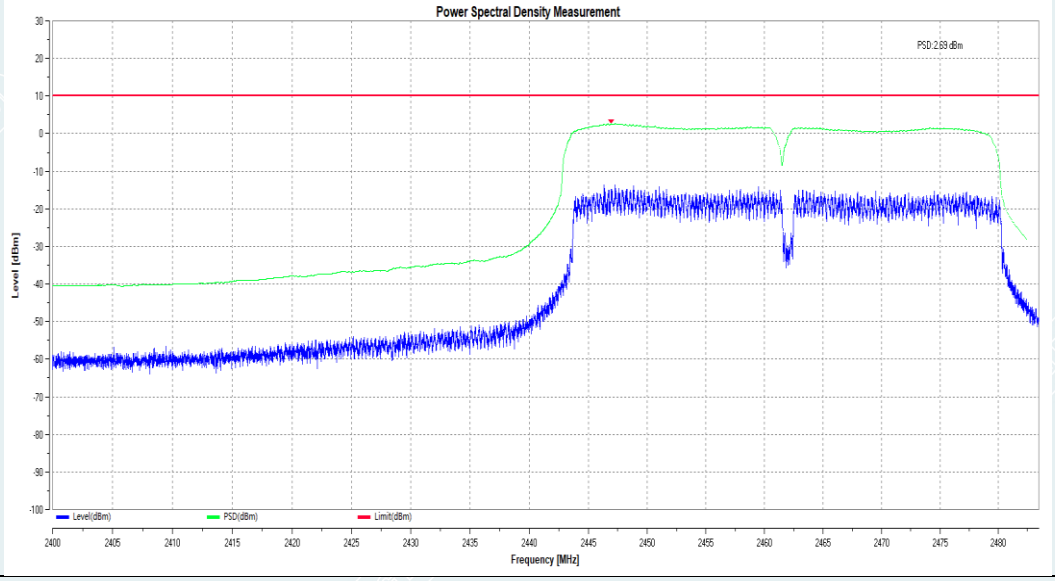
IEEE 802.11n HT40_Ant4_2422MHz



IEEE 802.11n HT40_Ant4_2442MHz



IEEE 802.11n HT40_Ant4_2462MHz



5.3 ADAPTIVITY

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.6

Test Method: ETSI EN300 328 V2.2.2/5.4.6.2.1

5.3.1 LIMIT

For Adaptive Non-FHSS equipment

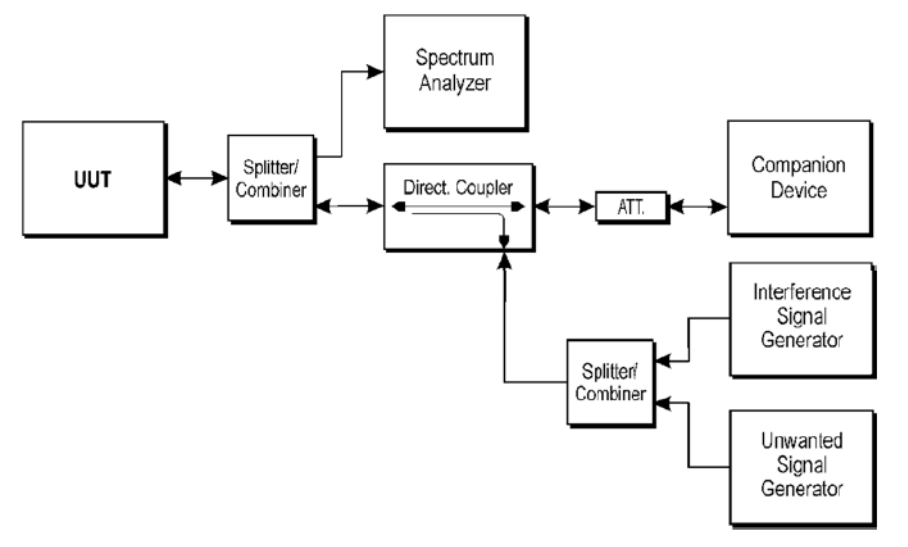
Clear Channel Assessment 18us - 160us

Channel Occupancy time < 13ms

Short Control Signaling Transmissions shall have a maximum TxOn/(TxOn+TxOff) ratio of 10% within any observation period of 50ms or within an observation period equal to the dwell time, whichever is less.

5.3.2 TEST CONFIGURATION

Conducted measurement:



5.3.3 TEST PROCEDURES

Test condition:	Normal test conditions
Test frequency:	2412MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2462MHz for IEEE 802.11n HT40
Test procedure:	Test procedure is according to Clause 5.4.6.2.1 of ETSI EN 300 328 V2.2.2
Remark:	/

5.3.4 TEST RESULTS

Test environment: Normal condition:

26.1℃/51%RH/101.0kPa

Test Engineer: Huang Tianmei

Test Date: 2023-12-06

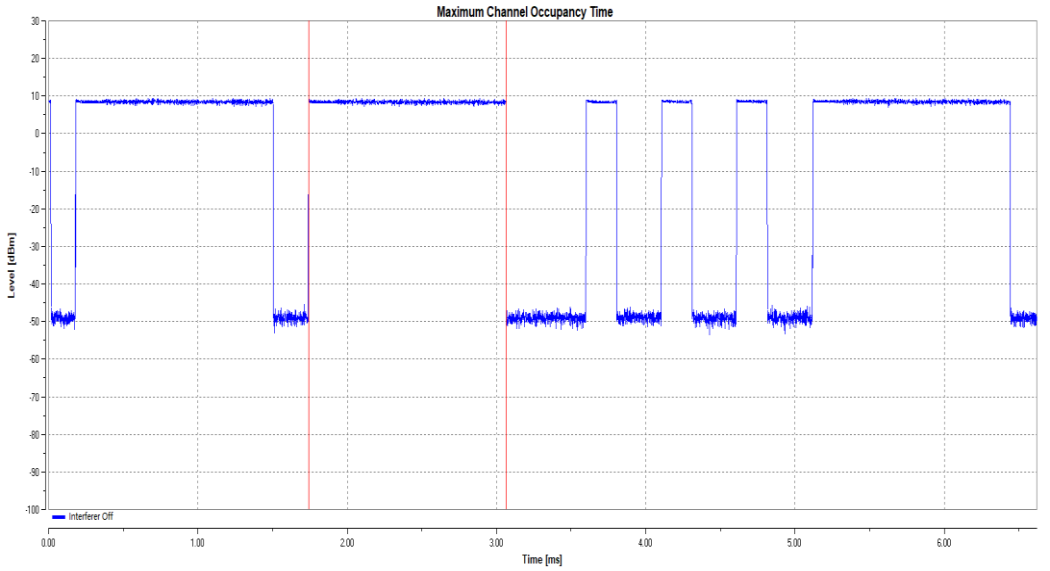
Test Voltage: DC 5V

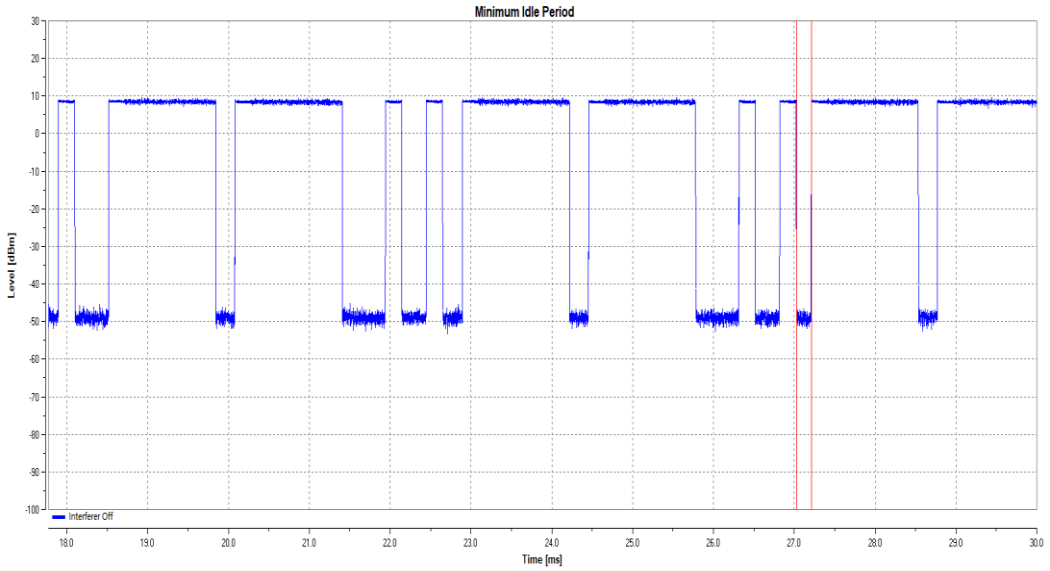
Test Mode	Antenna	Freq [MHz]	Max.COT [ms]	Limit [ms]	Min.Idle Time[ms]	Limit [ms]	Verdict
IEEE 802.11b	Ant4	2412	1.324	13	0.185	0.018	PASS
		2472	1.324	13	0.105	0.018	PASS
IEEE 802.11g	Ant4	2412	0.714	13	0.065	0.018	PASS
		2472	0.254	13	0.061	0.018	PASS
IEEE 802.11n HT20	Ant4	2412	3.561	13	0.062	0.018	PASS
		2472	3.561	13	0.066	0.018	PASS
IEEE 802.11n HT40	Ant4	2422	12.627	13	0.062	0.018	PASS
		2462	3.121	13	0.062	0.018	PASS

Test Mode	Antenna	Freq [MHz]	Add Signal Type	Add Signal Time [ms]	Add Signal Level [dBm]	Max. Short Time [%]	Limit [%]	Verdict
IEEE 802.11b	Ant4	2412	AWGN	3001	-66.92	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
		2472	AWGN	3001	-65.99	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
IEEE 802.11g	Ant4	2412	AWGN	3001	-64.49	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
		2472	AWGN	3001	-63.61	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
IEEE 802.11n HT20	Ant4	2412	AWGN	3001	-63.57	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
		2472	AWGN	3001	-62.69	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
IEEE 802.11n HT40	Ant4	2422	AWGN	3001	-63.82	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS
		2462	AWGN	3001	-63.20	0.00	10	PASS
			CW	63001	-34.00	0.00	10	PASS

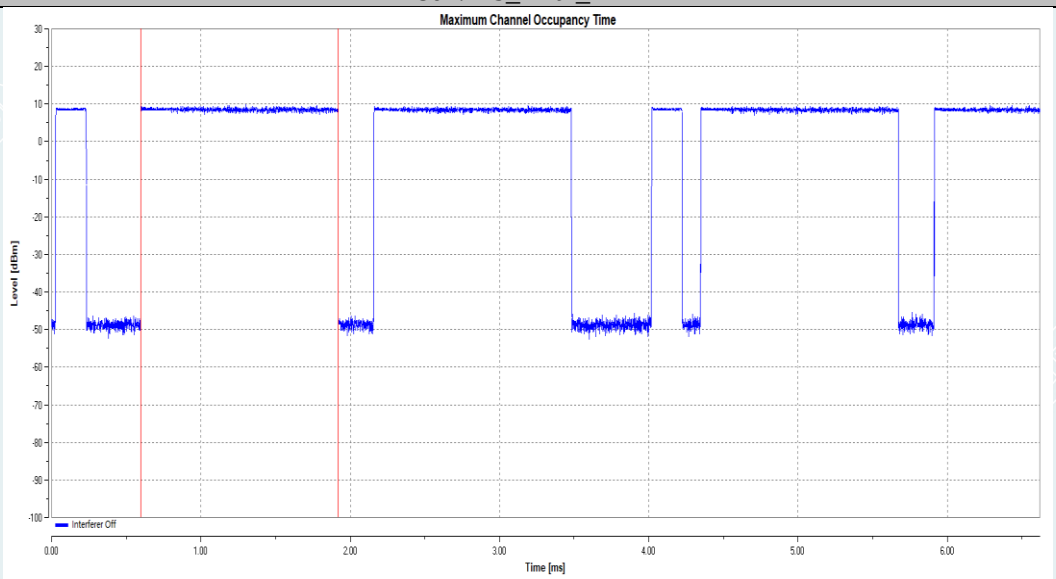
Test Graphs

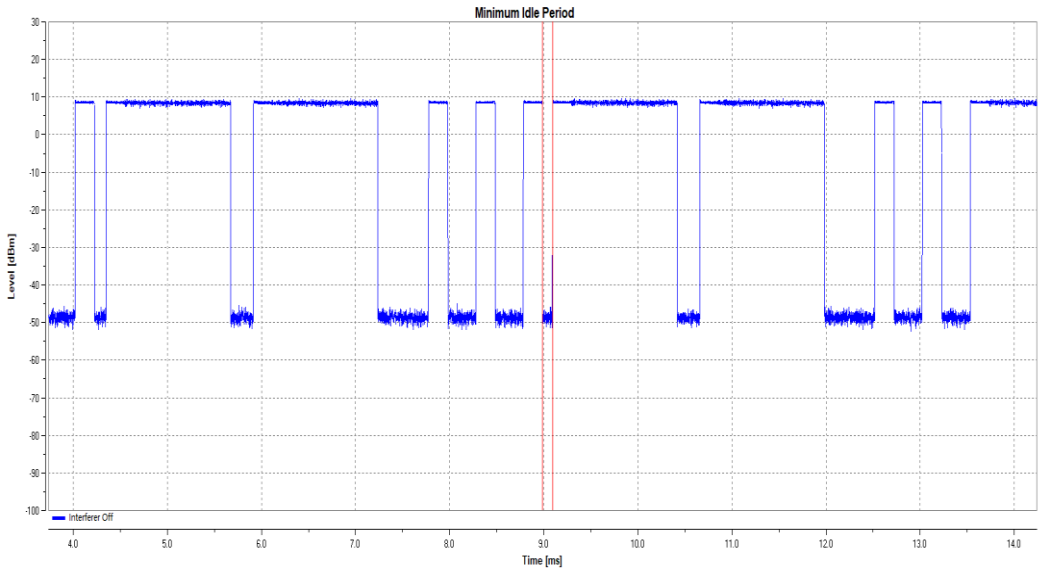
IEEE 802.11b_Ant4_2412MHz



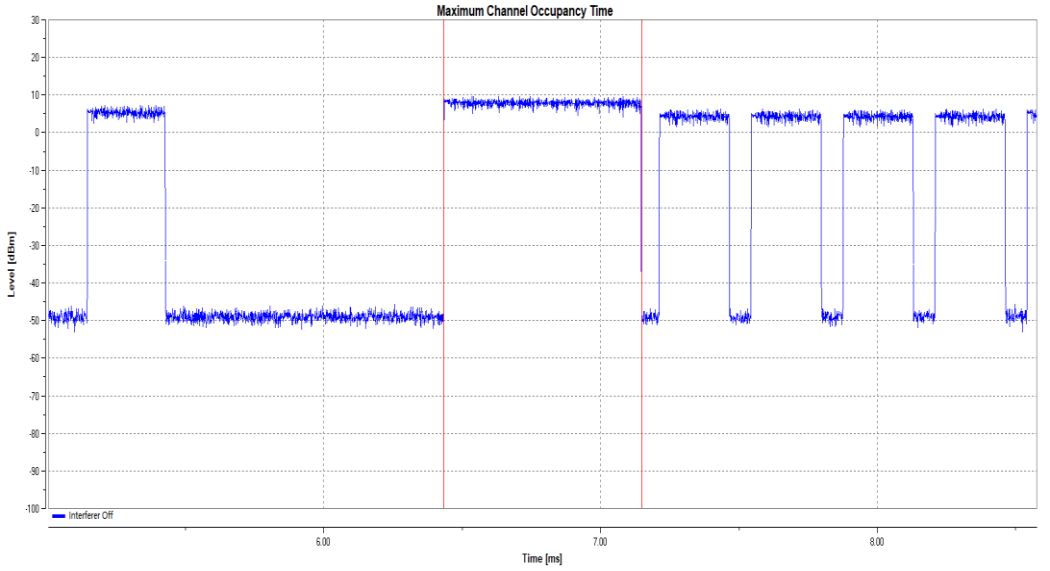


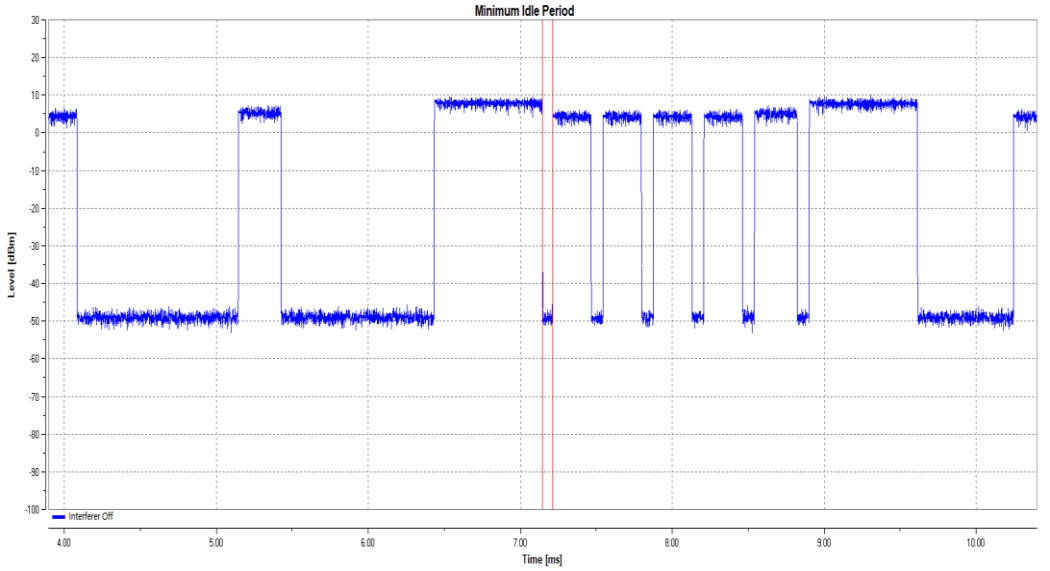
IEEE 802.11b_Ant4_2472MHz





IEEE 802.11g_Ant4_2412MHz





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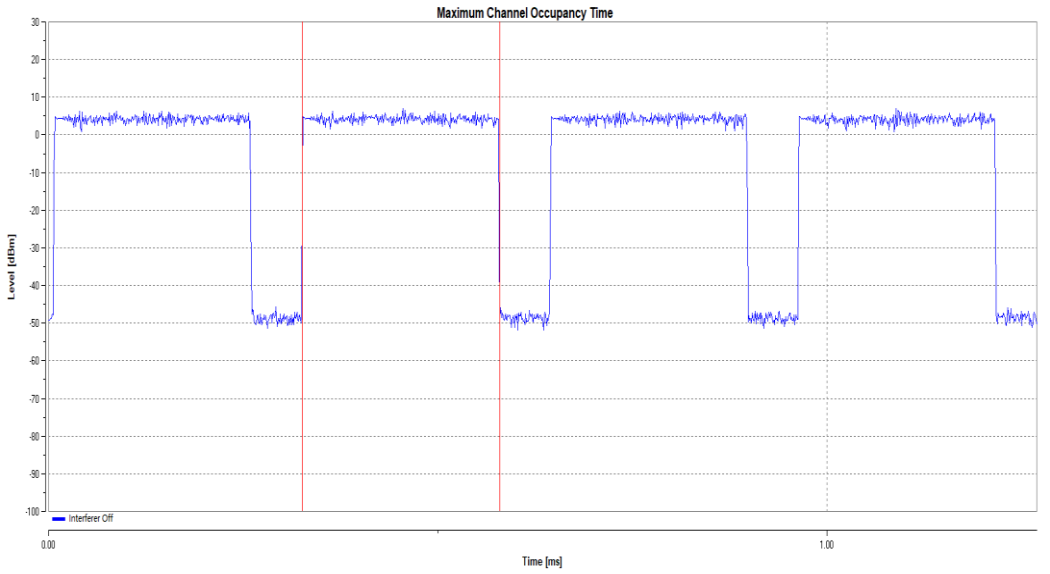
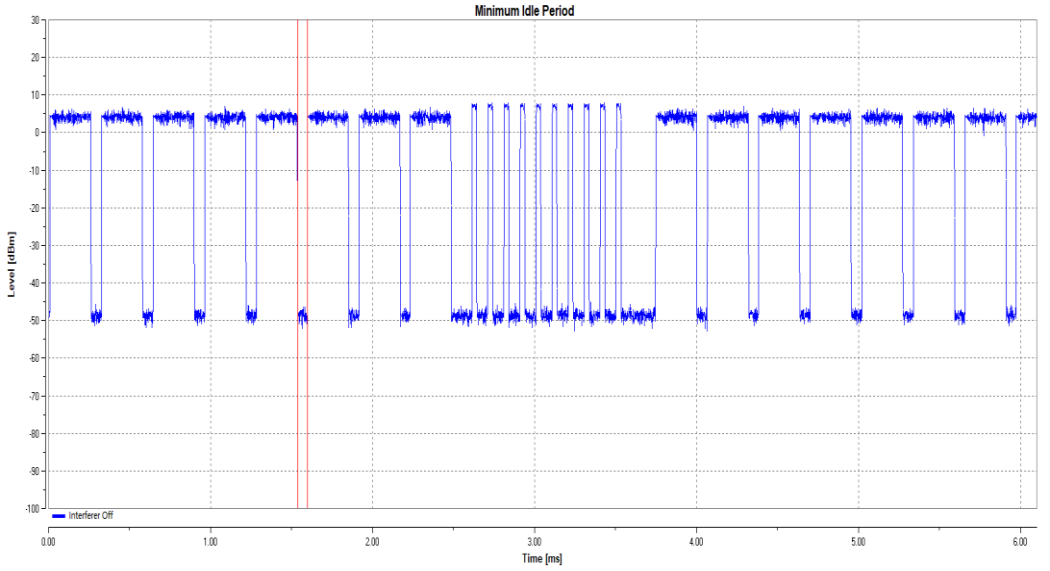
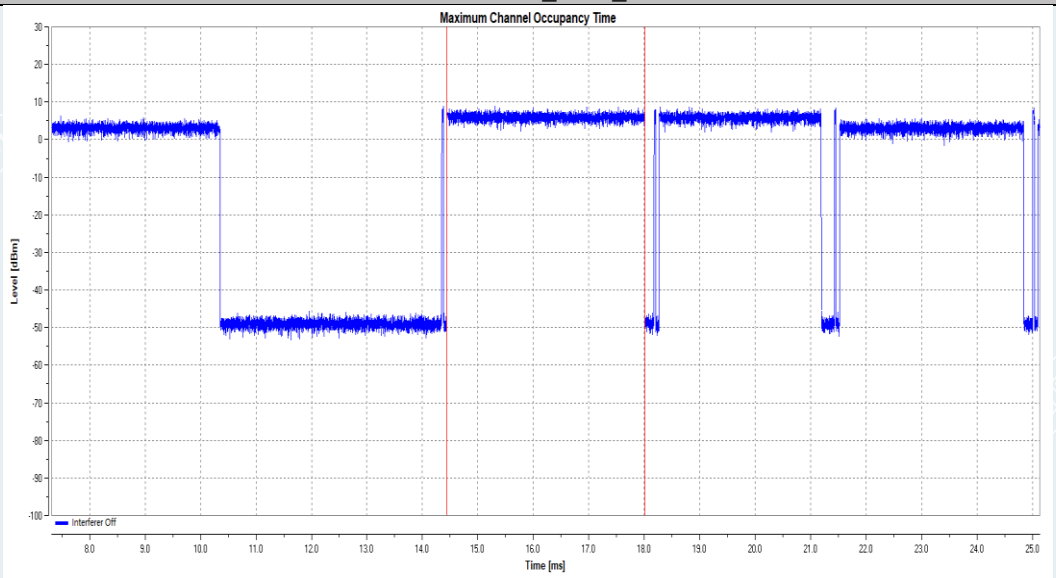
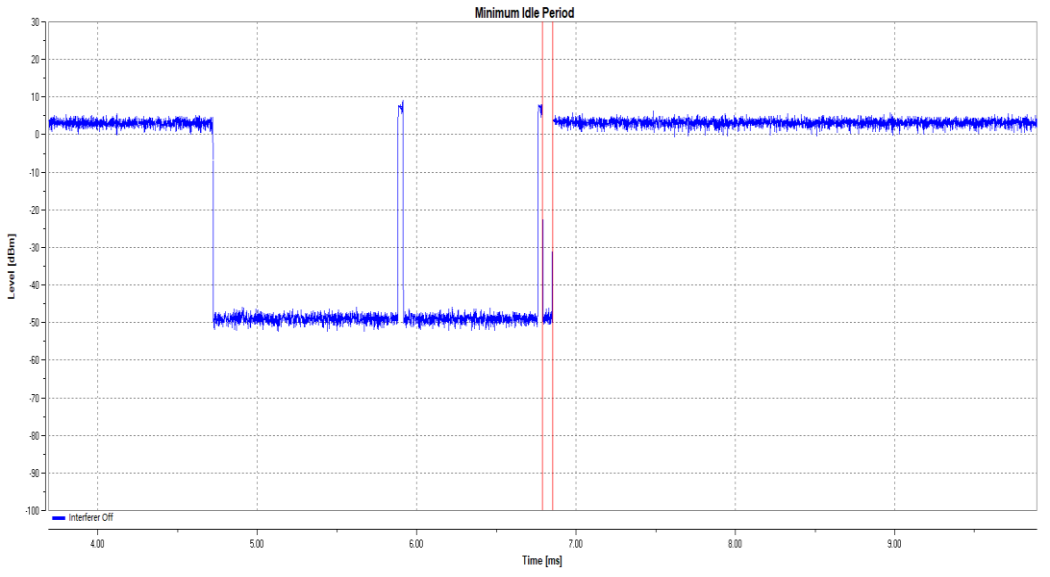
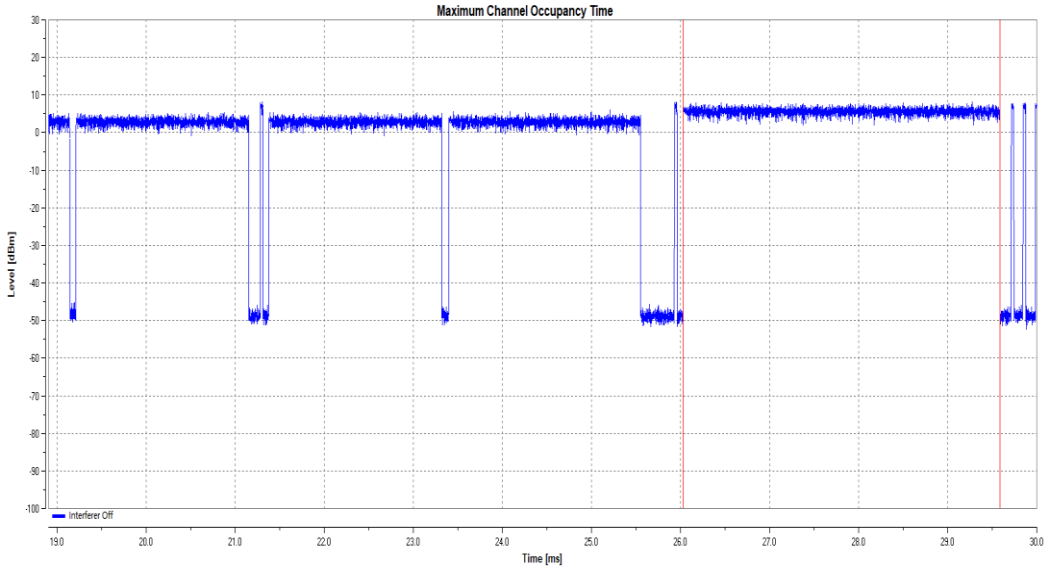
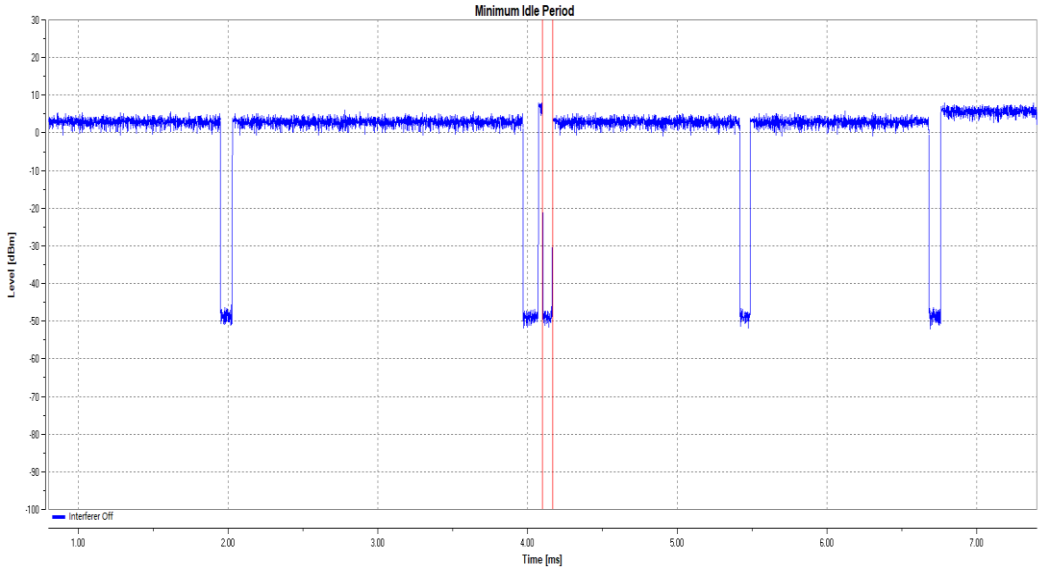


IEEE 802.11n HT20_Ant4_2412MHz




IEEE 802.11n HT20_Ant4_2472MHz





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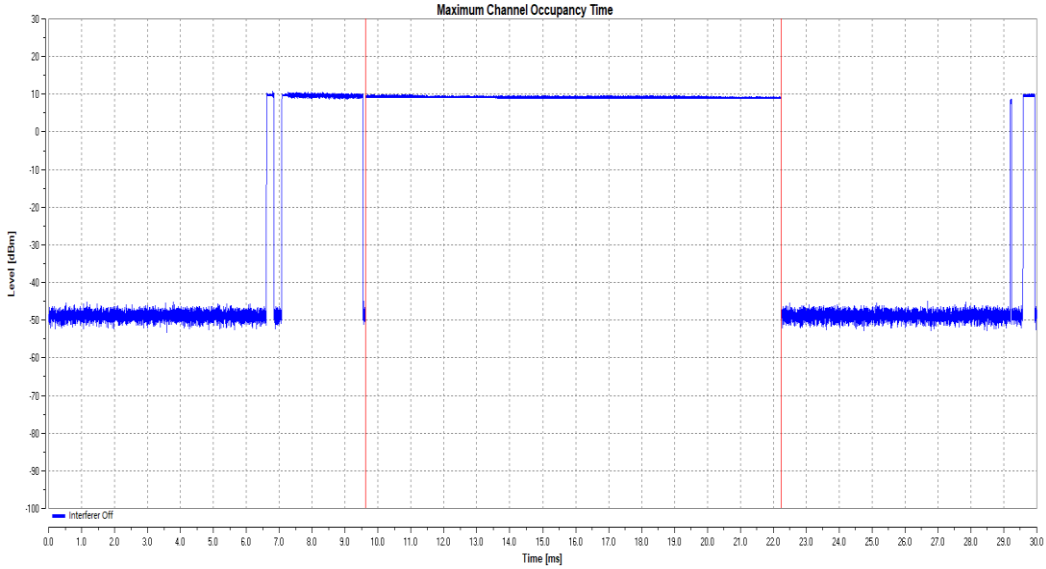
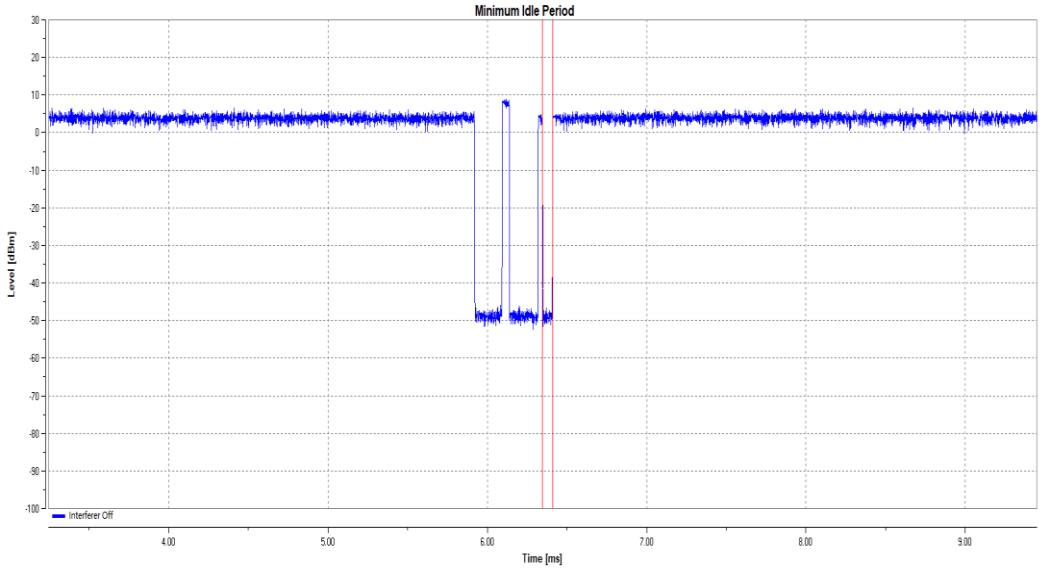
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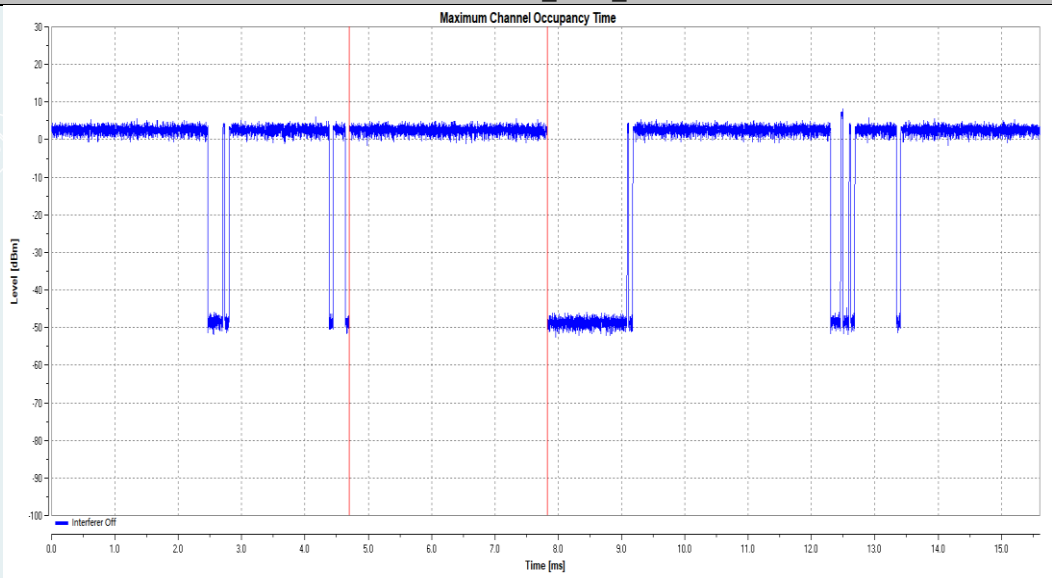

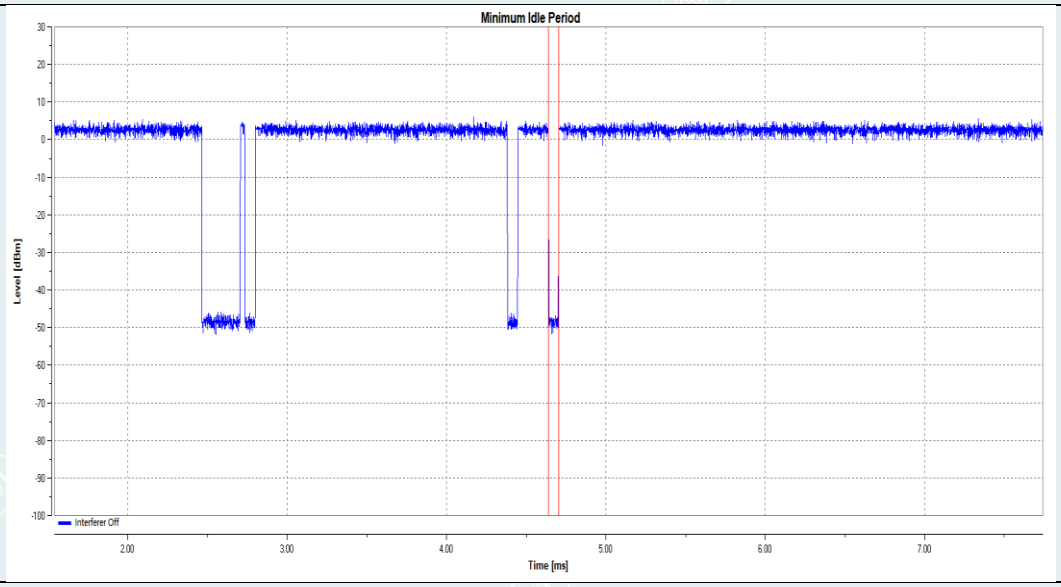

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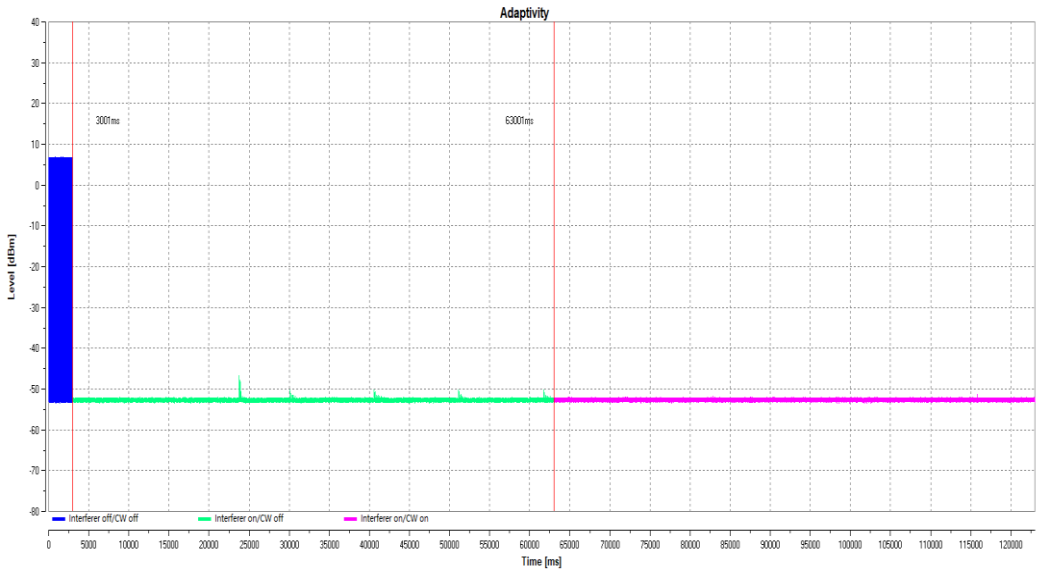
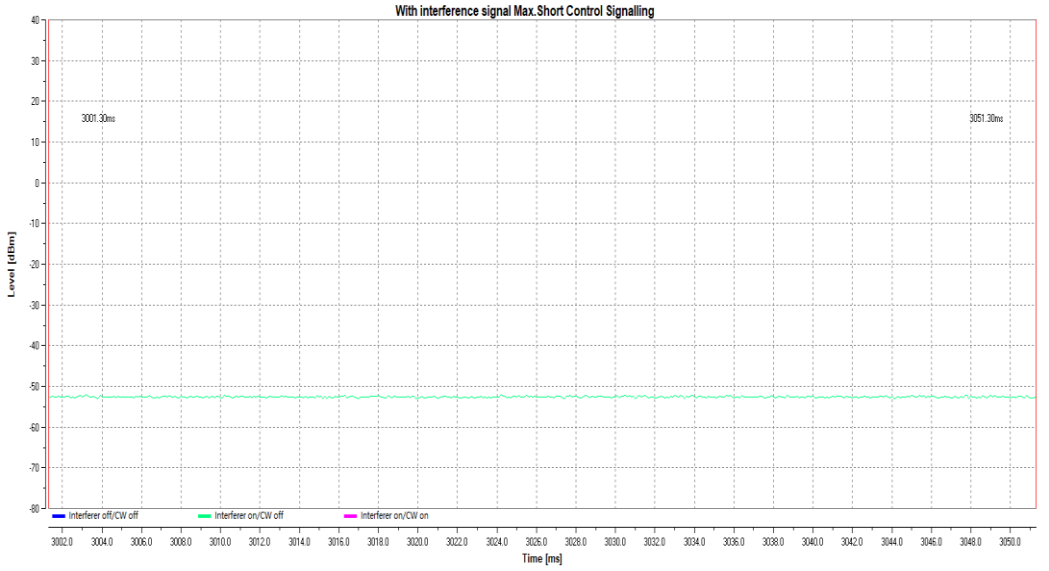
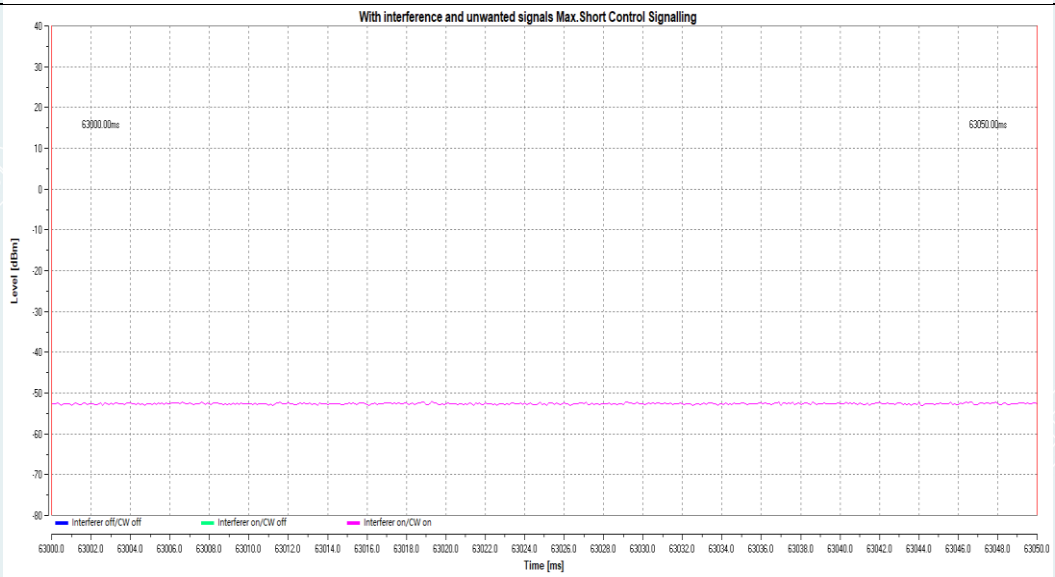

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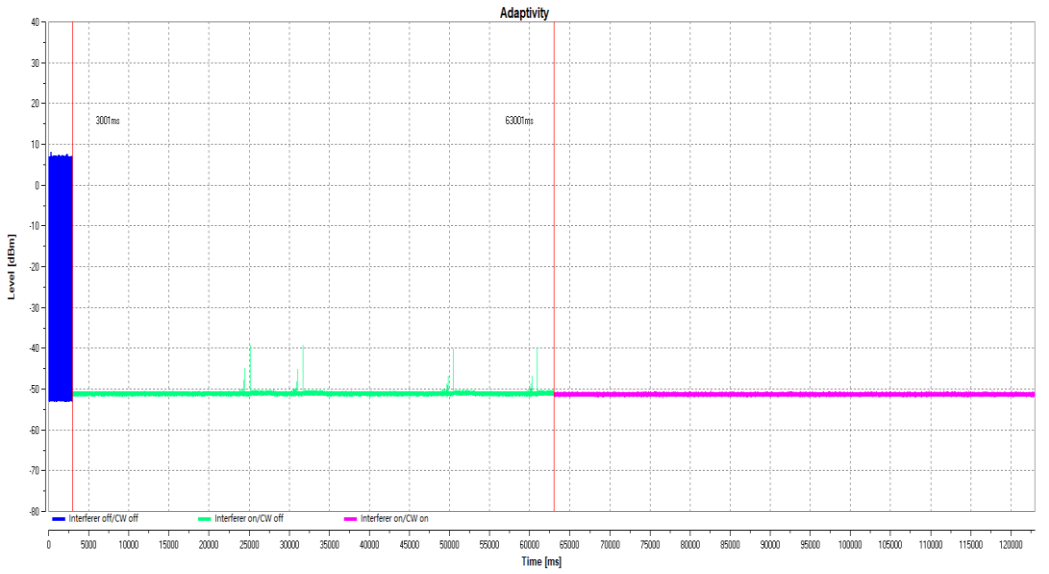
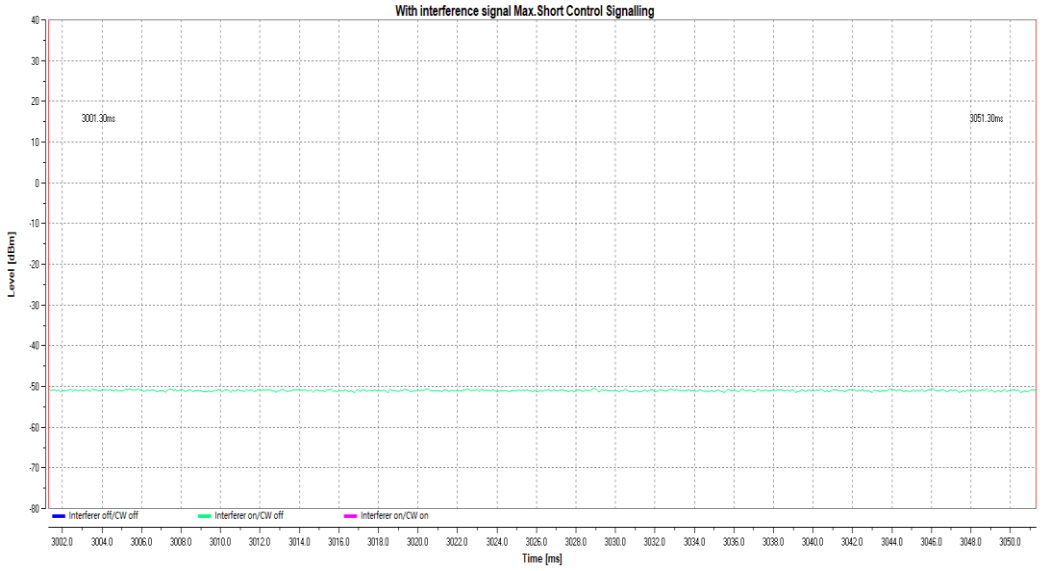
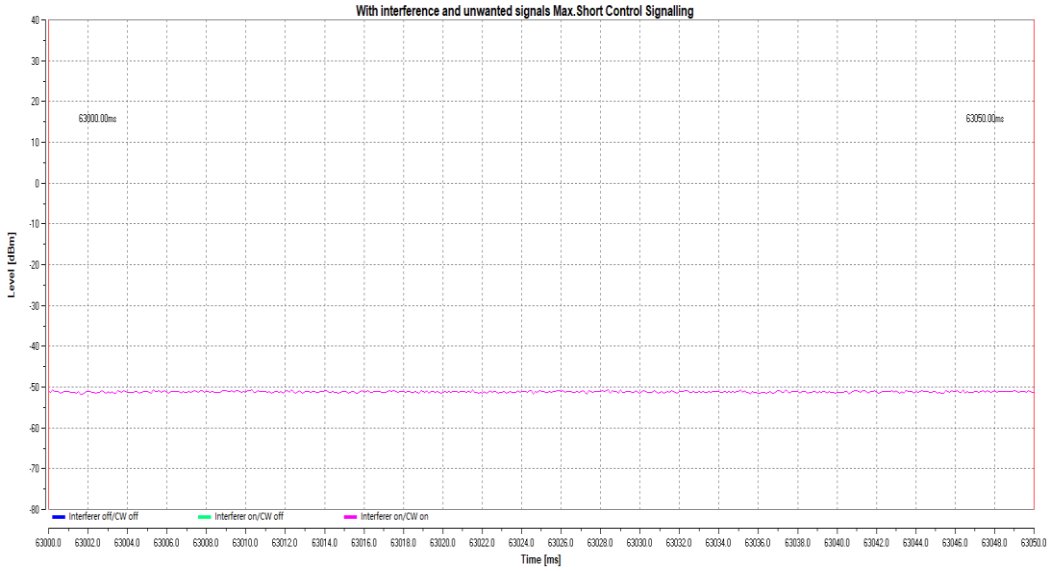

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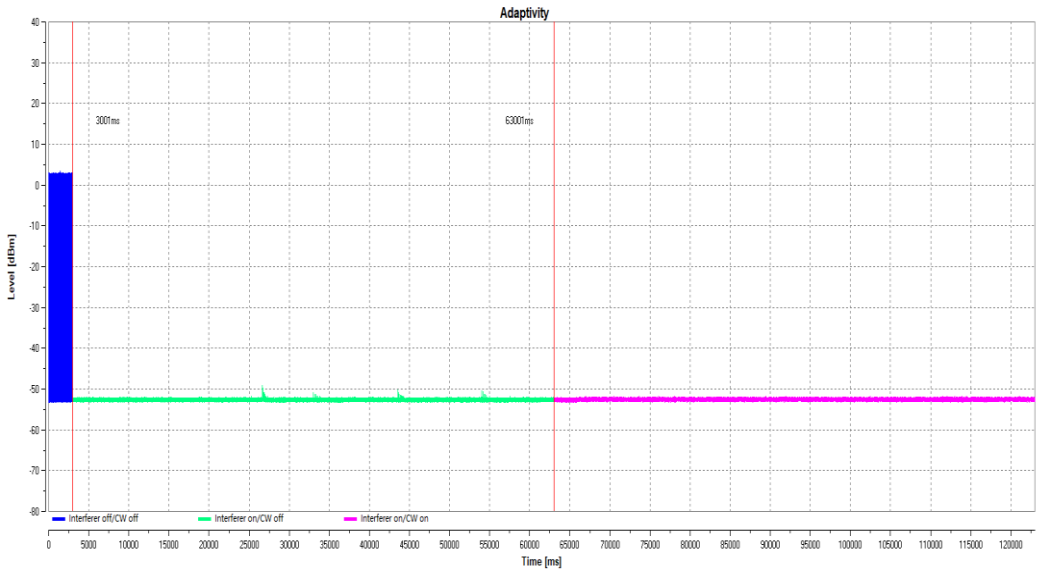
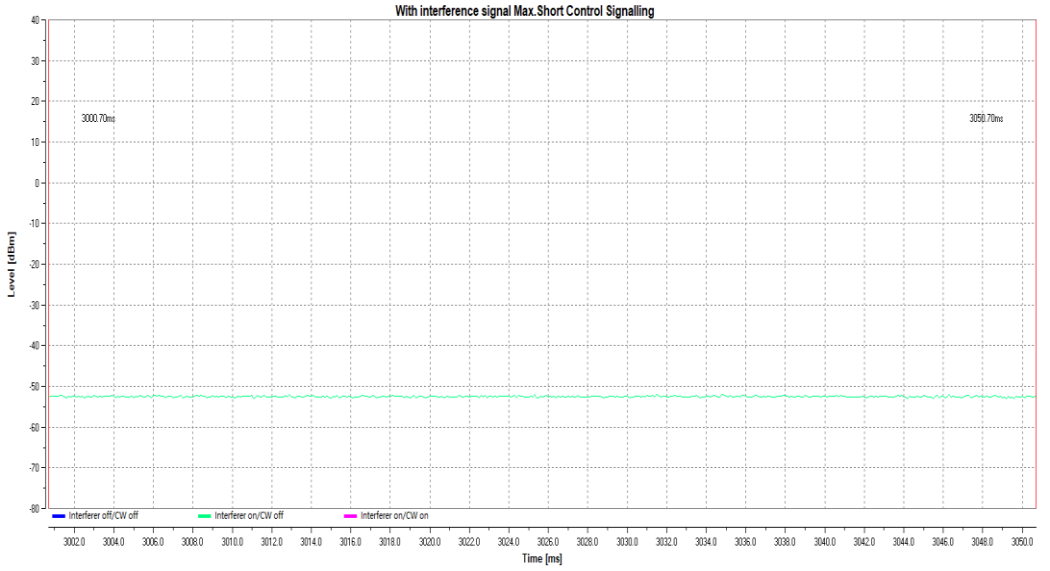
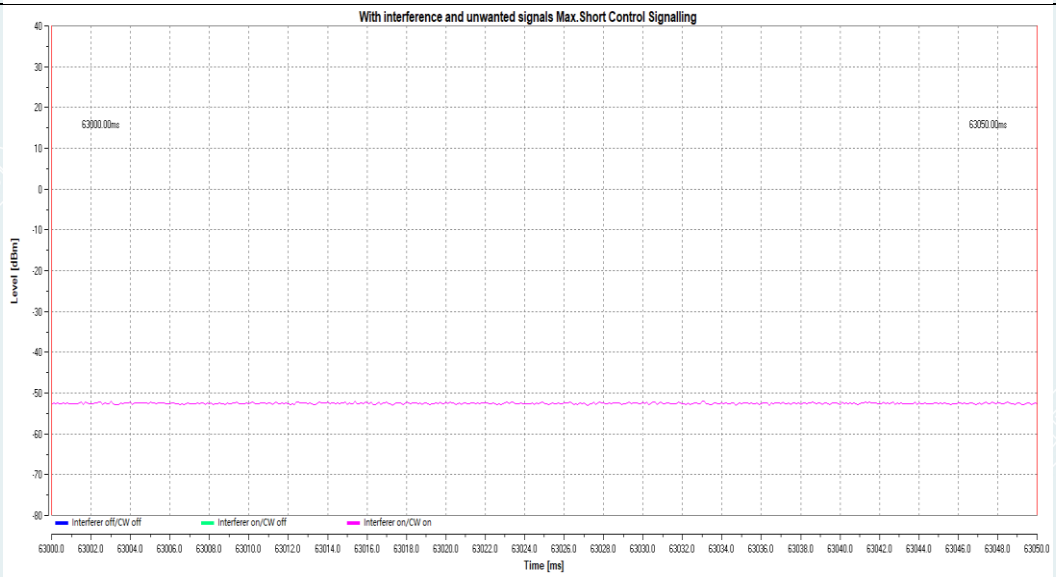

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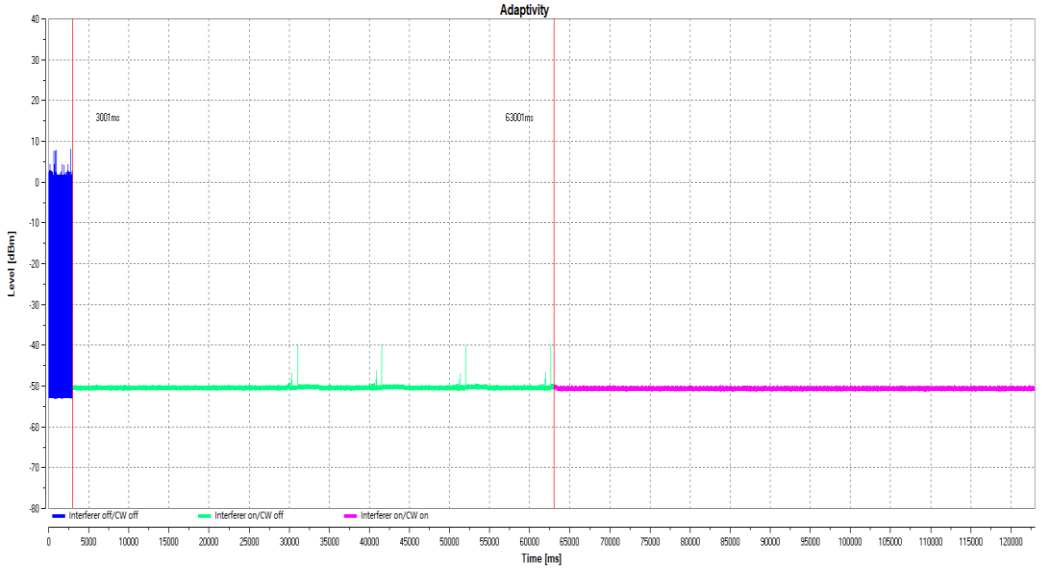
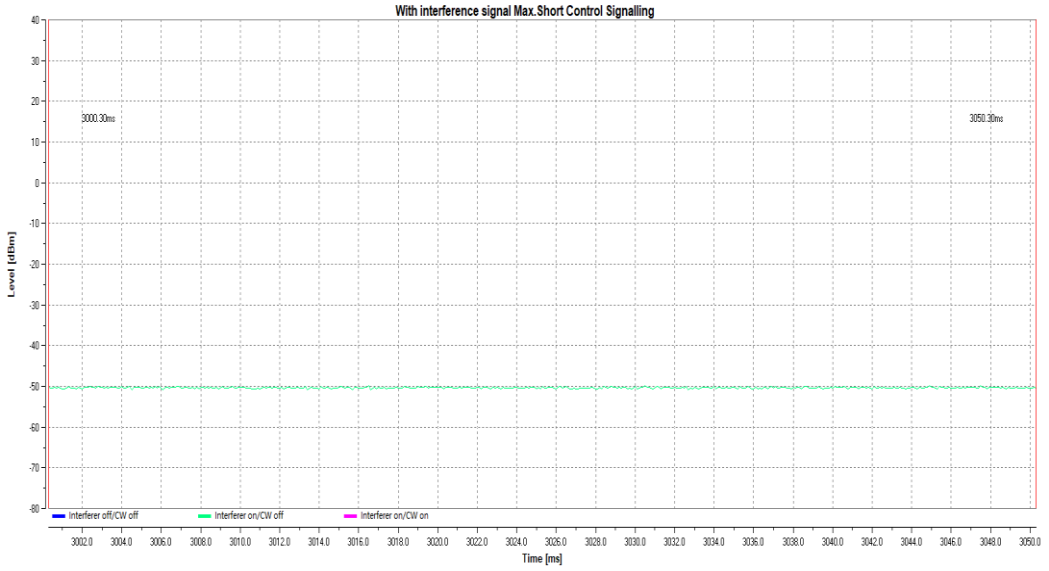
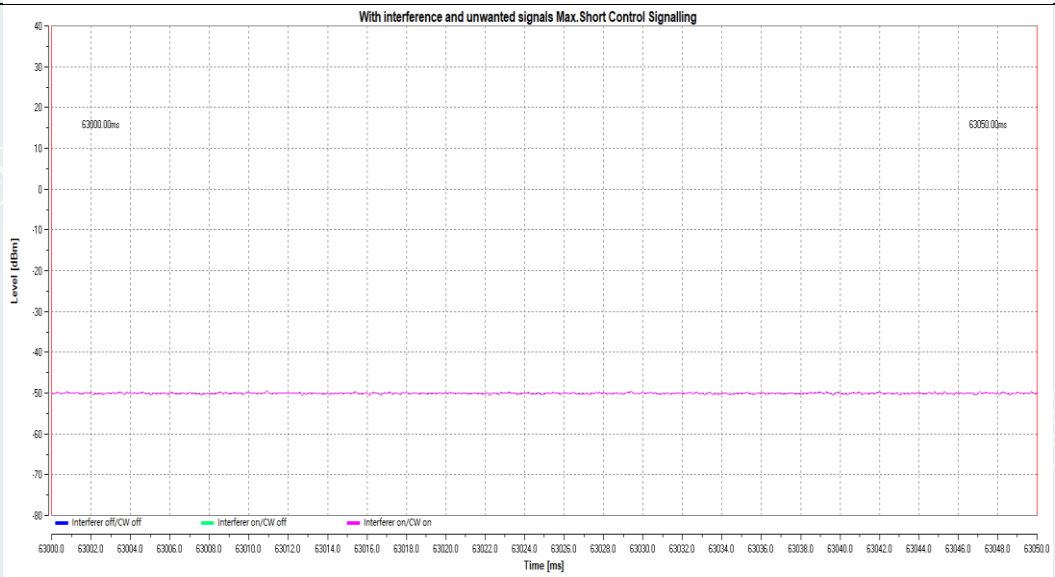

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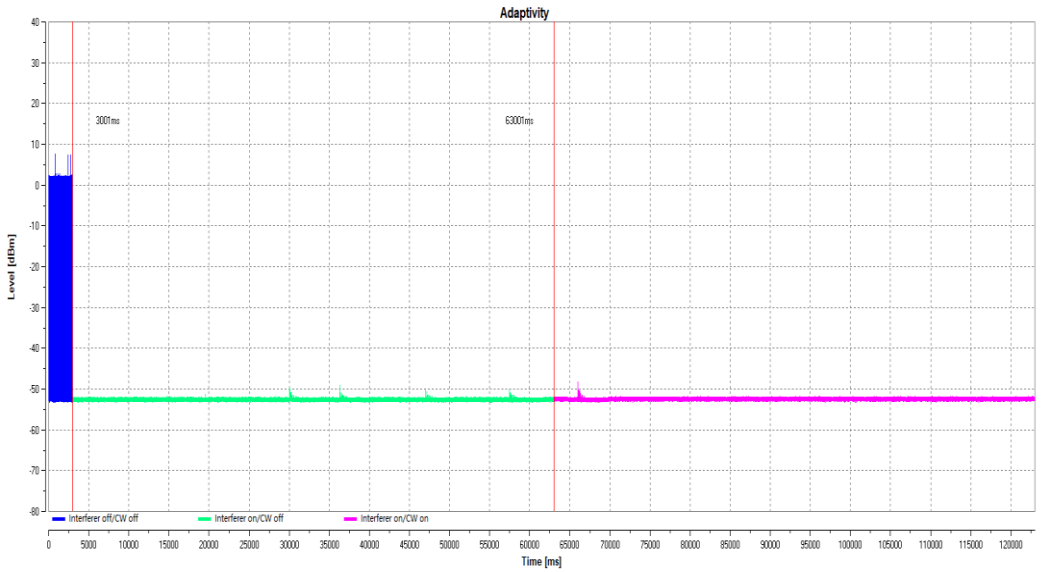
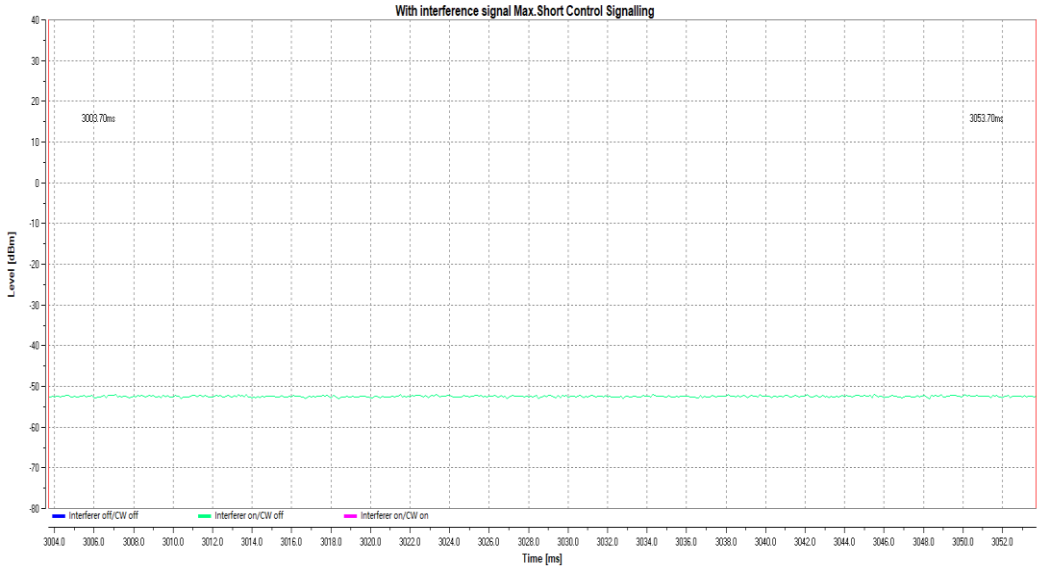
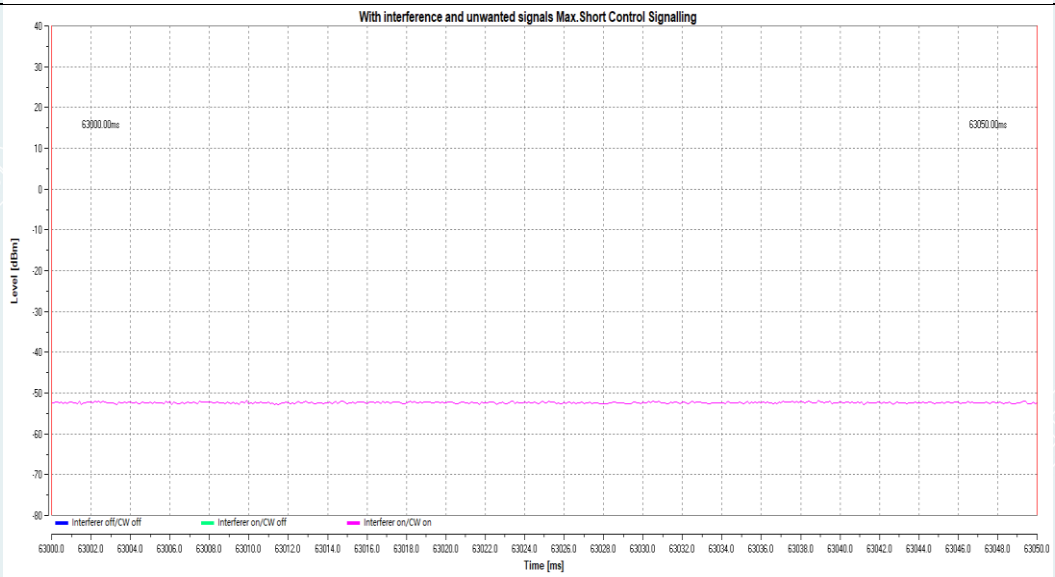

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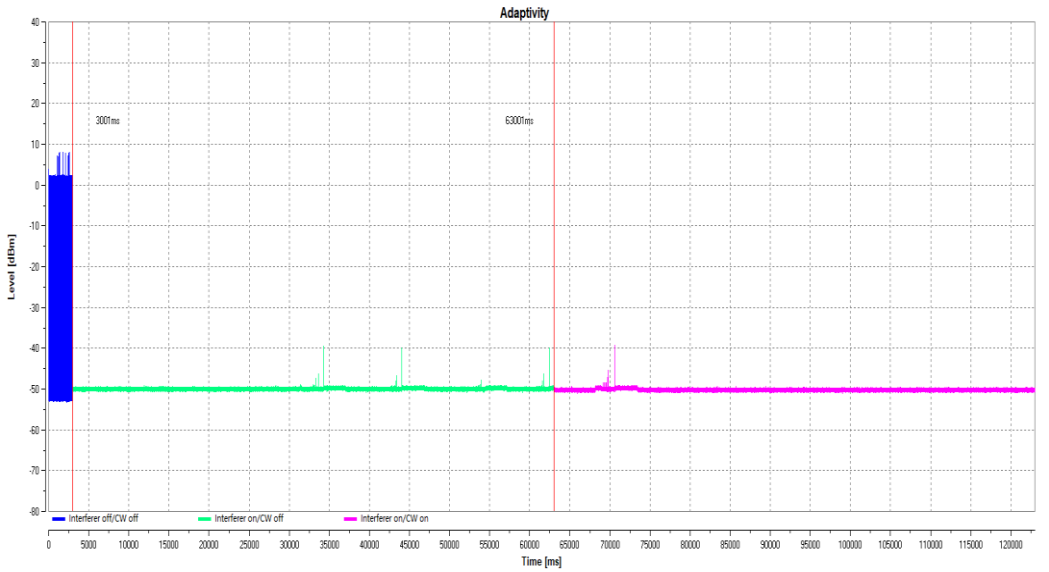
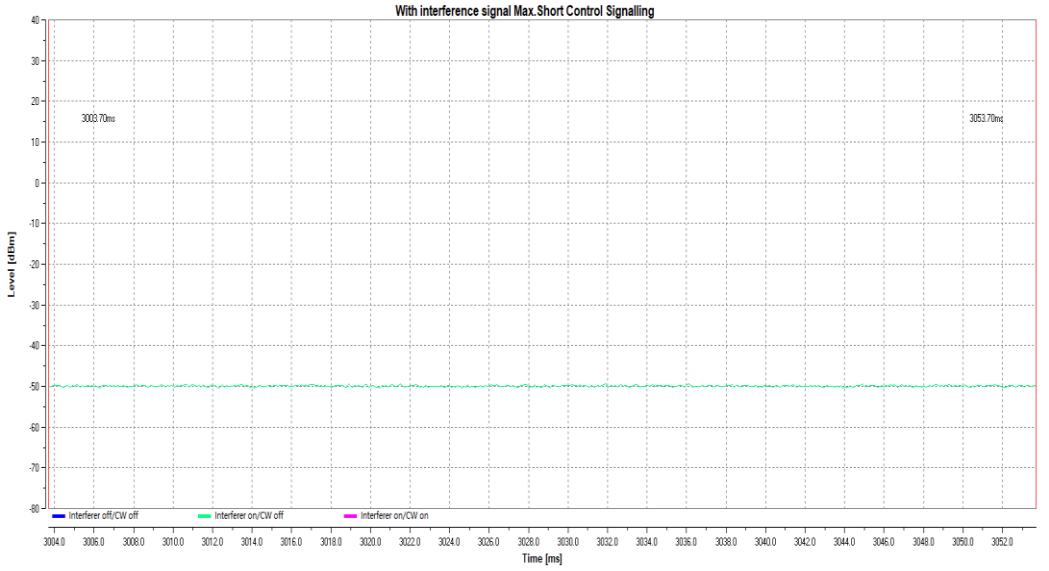
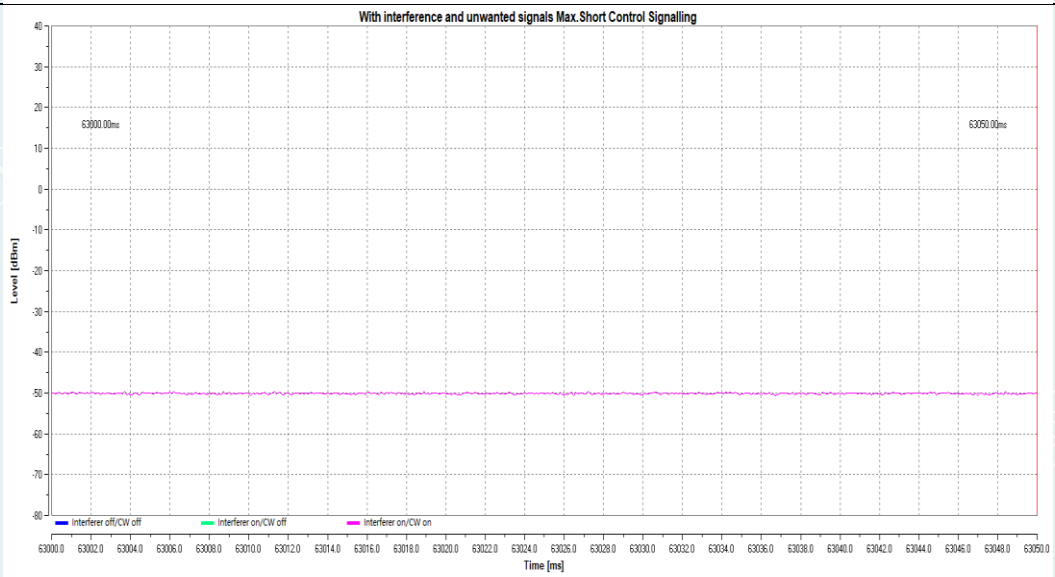

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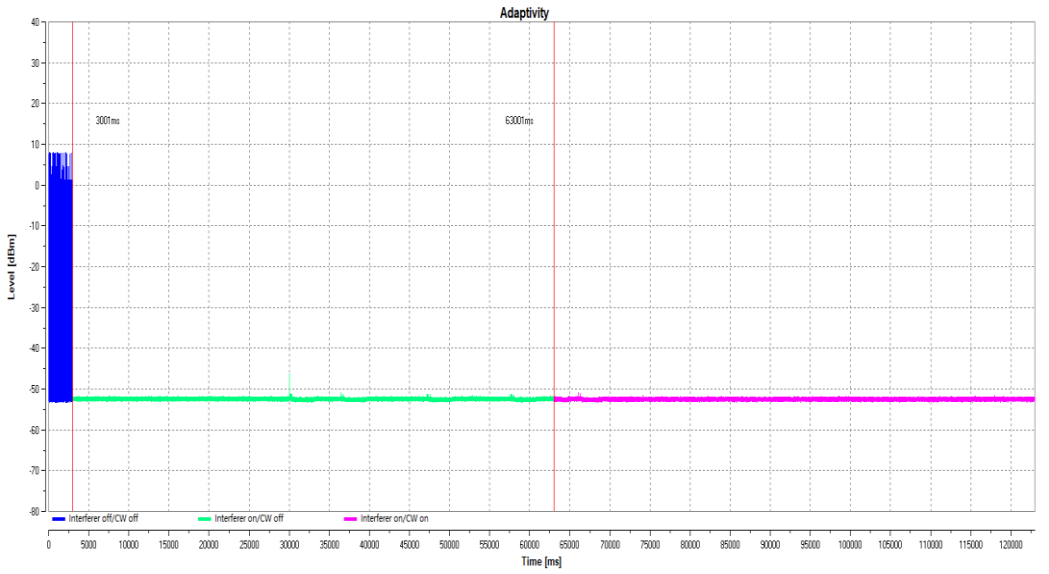
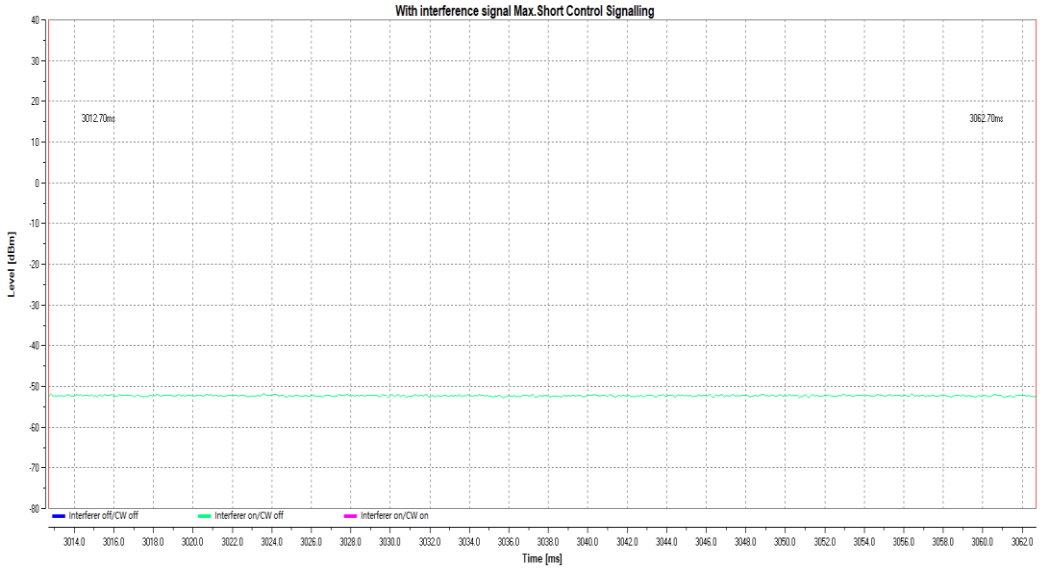
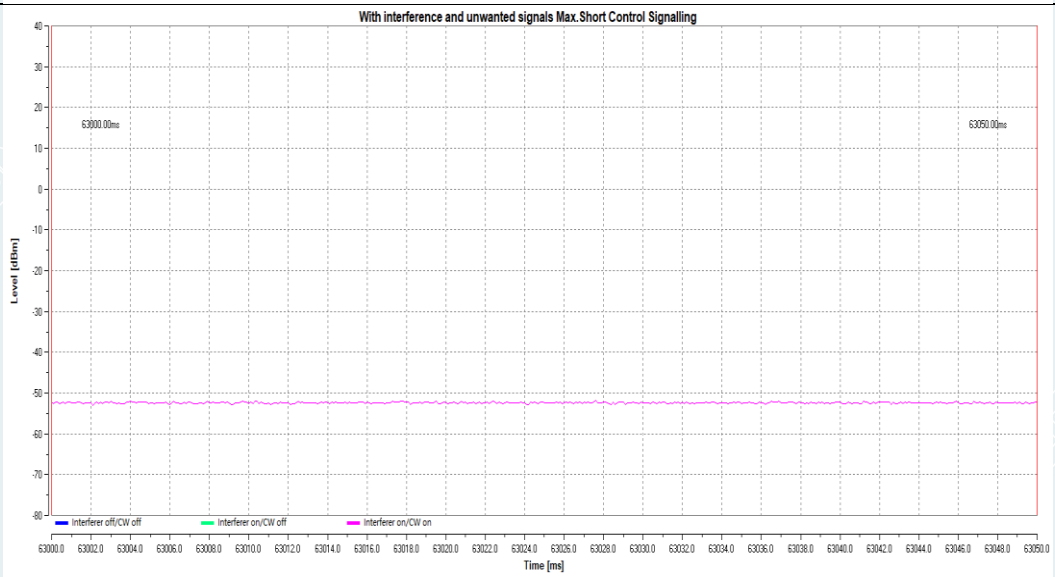

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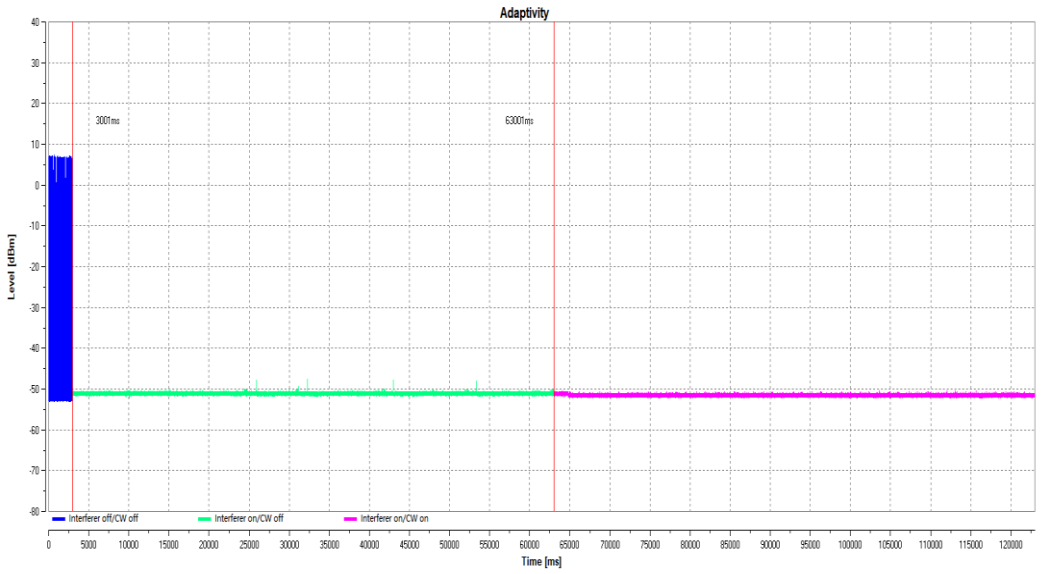
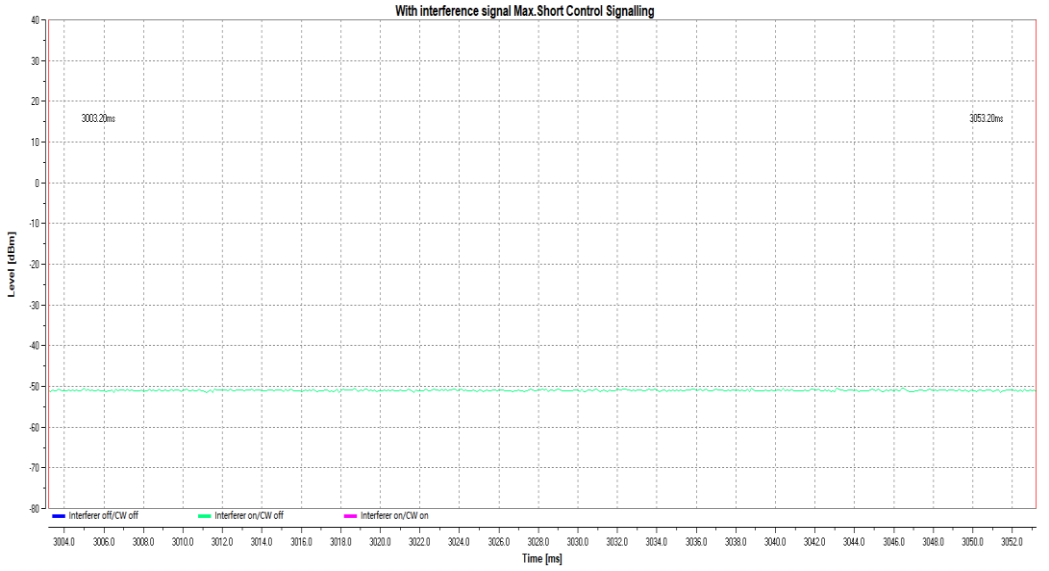
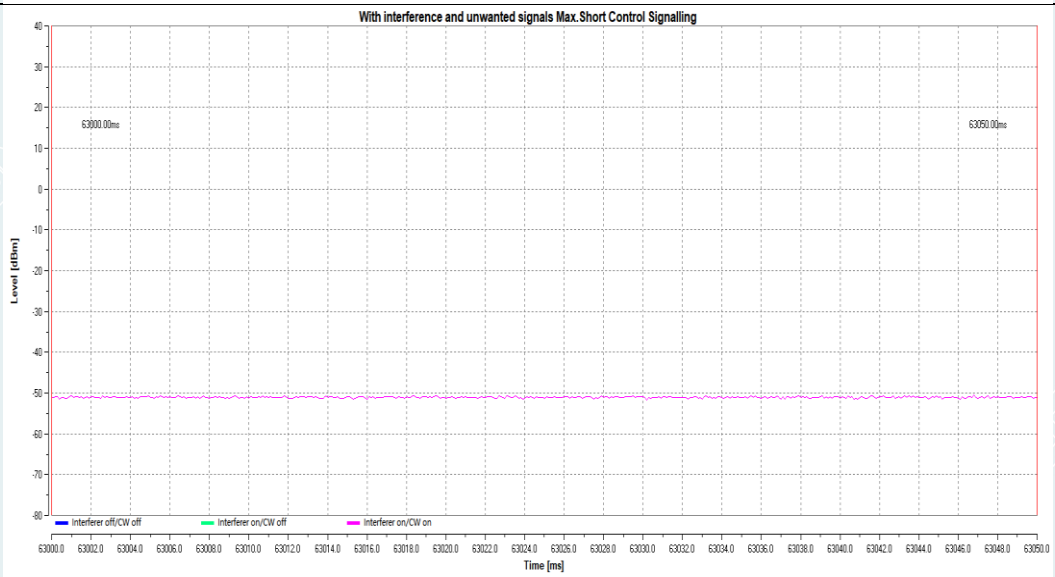




5.4 OCCUPIED CHANNEL BANDWIDTH

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.7

Test Method: ETSI EN300 328 V2.2.2/5.4.7.2.1

5.4.1 LIMIT

This requirement applies to all types of non-FHSS equipment.

The Occupied Channel Bandwidth shall fall completely within the band given in table 2.

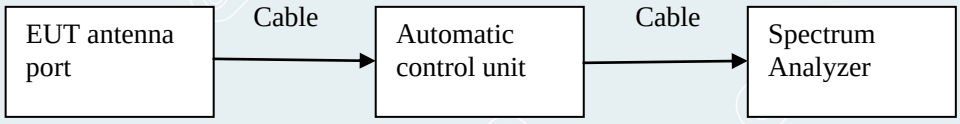
In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p. greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

Table 2: Service frequency bands

	Service frequency bands
Transmit	2 400 MHz to 2 483,5 MHz
Receive	2 400 MHz to 2 483,5 MHz

5.4.2 TEST CONFIGURATION

Conducted measurement:



5.4.3 TEST PROCEDURES

Test condition: Normal test conditions.

Test frequency: 2412MHz, 2442MHz, 2472MHz for IEEE 802.11b/g/n HT20
2422MHz, 2442MHz, 2462MHz for IEEE 802.11n HT40

Test procedure: Test procedure is according to Clause 5.4.7.2.1 of ETSI EN 300 328 V2.2.2

Remark: /

5.4.4 TEST RESULTS

Test environment: Normal condition:

24.1℃/39%RH/101.0kPa

Test Engineer: Huang Tianmei

Test Date: 2023-11-16

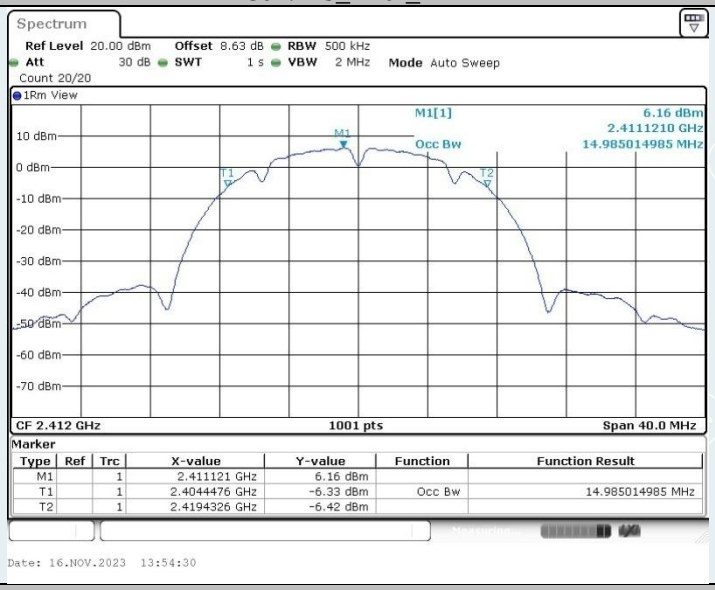
Test Voltage: DC 5V

Test Mode	Antenna	Freq[MHz]	OCB[MHz]	F_L[MHz]	F_H[MHz]	Limit[MHz]	Verdict
IEEE 802.11b	Ant4	2412	14.985	2404.4476	2419.4326	2400 to 2483.5	PASS
		2442	15.065	2434.4875	2449.5524	2400 to 2483.5	PASS
		2472	15.105	2464.4076	2479.5125	2400 to 2483.5	PASS
IEEE 802.11g	Ant4	2412	16.623	2403.6484	2420.2717	2400 to 2483.5	PASS
		2442	16.663	2433.6484	2450.3117	2400 to 2483.5	PASS
		2472	16.663	2463.6484	2480.3117	2400 to 2483.5	PASS
IEEE 802.11n HT20	Ant4	2412	17.782	2403.0889	2420.8711	2400 to 2483.5	PASS
		2442	17.742	2433.1289	2450.8711	2400 to 2483.5	PASS
		2472	17.782	2463.0889	2480.8711	2400 to 2483.5	PASS
IEEE 802.11n HT40	Ant4	2422	36.364	2403.7782	2440.1419	2400 to 2483.5	PASS
		2442	36.284	2423.8581	2460.1419	2400 to 2483.5	PASS
		2462	36.364	2443.7782	2480.1419	2400 to 2483.5	PASS

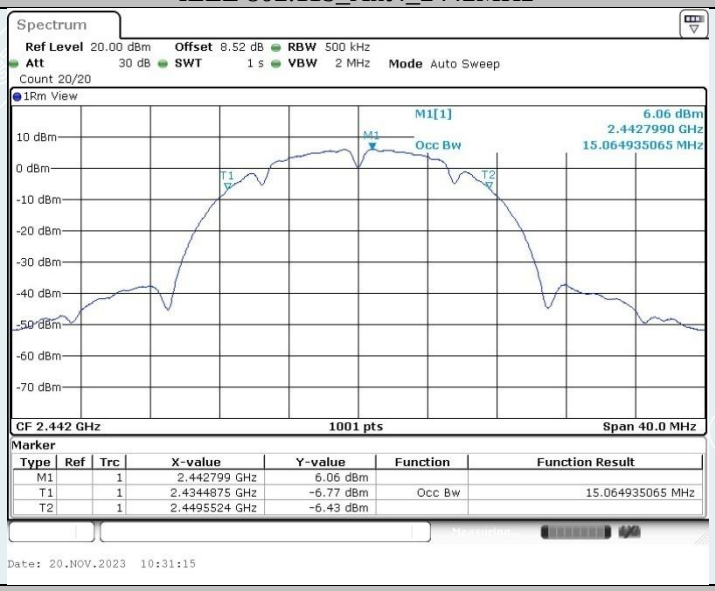
---------- The following blanks ----------

Test Graphs

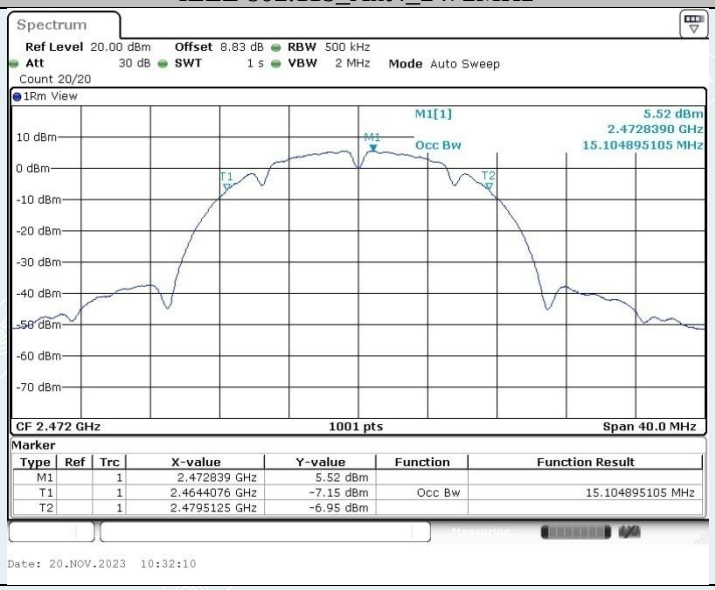
IEEE 802.11b_Ant4_2412MHz



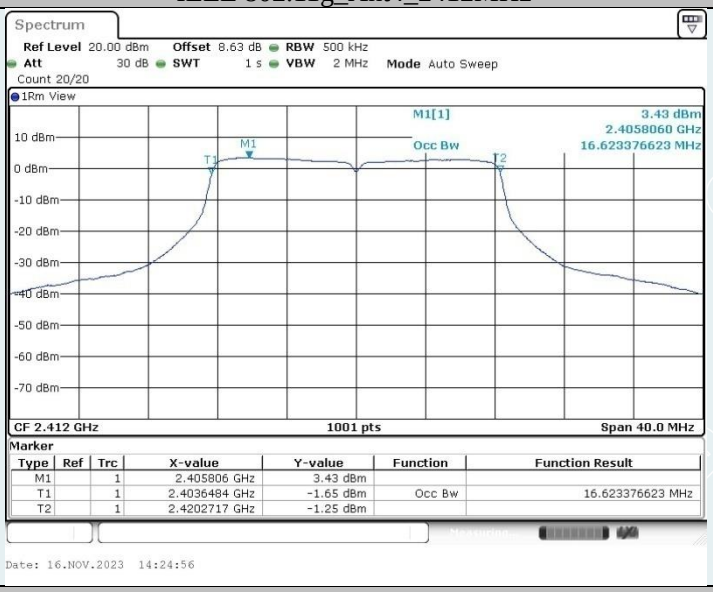
IEEE 802.11b_Ant4_2442MHz



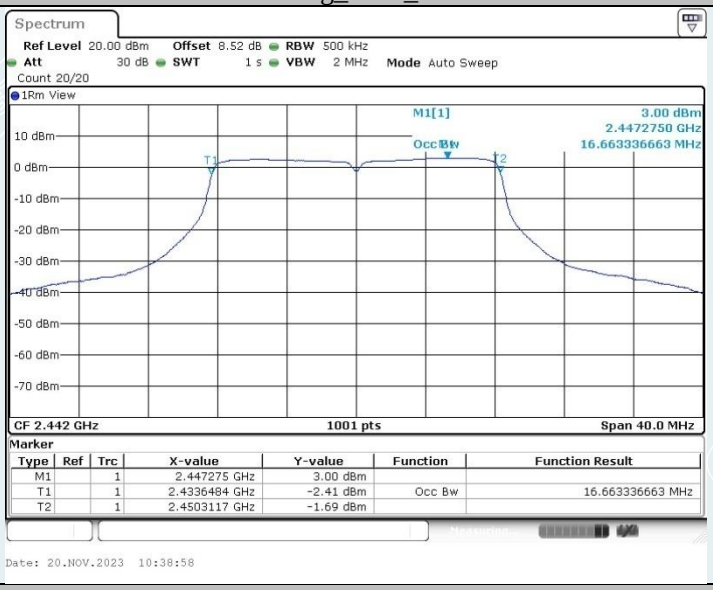
IEEE 802.11b_Ant4_2472MHz



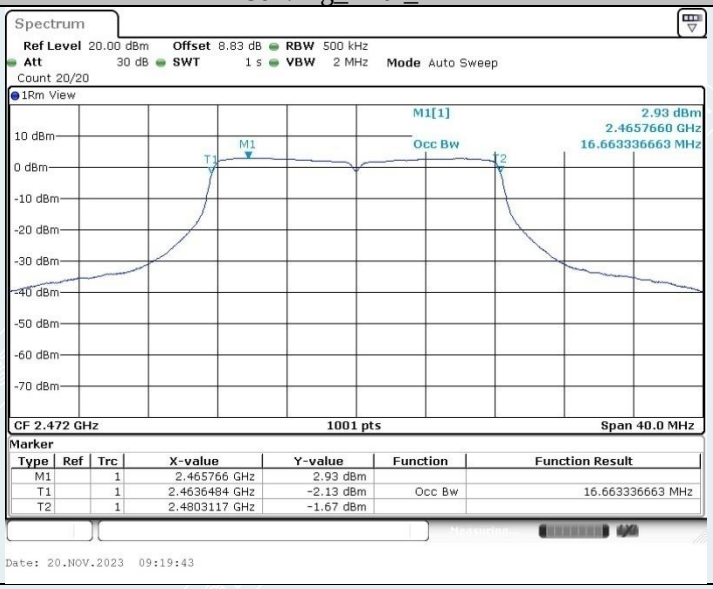
IEEE 802.11g_Ant4_2412MHz



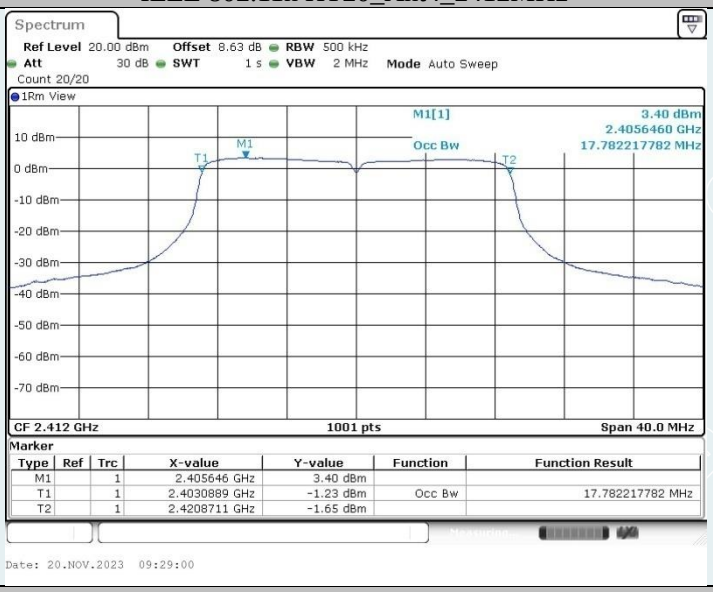
IEEE 802.11g_Ant4_2442MHz



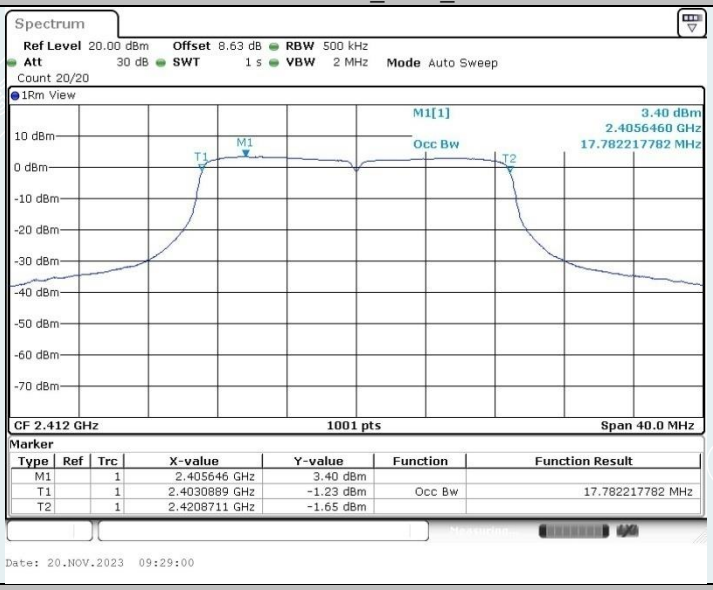
IEEE 802.11g_Ant4_2472MHz



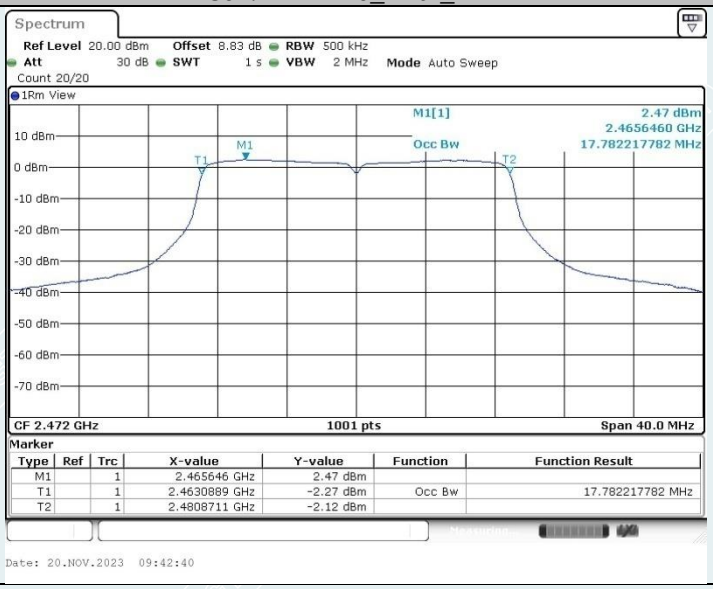
IEEE 802.11n HT20_Ant4_2412MHz



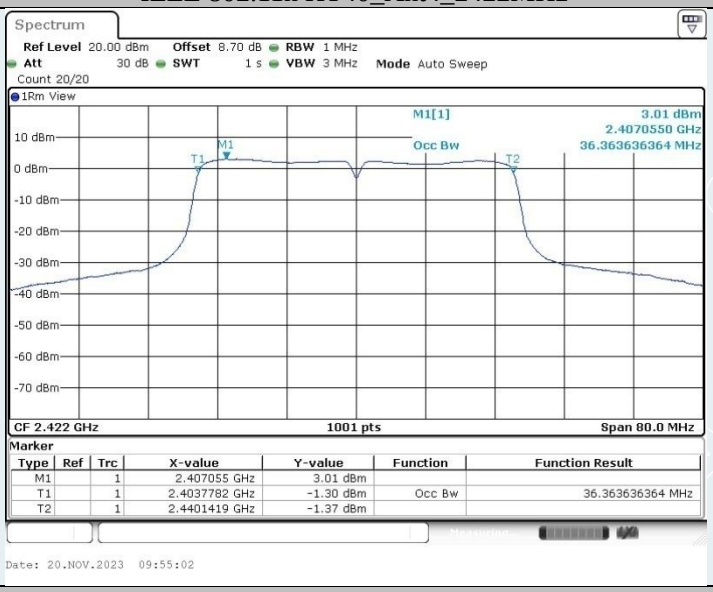
IEEE 802.11n HT20_Ant4_2442MHz



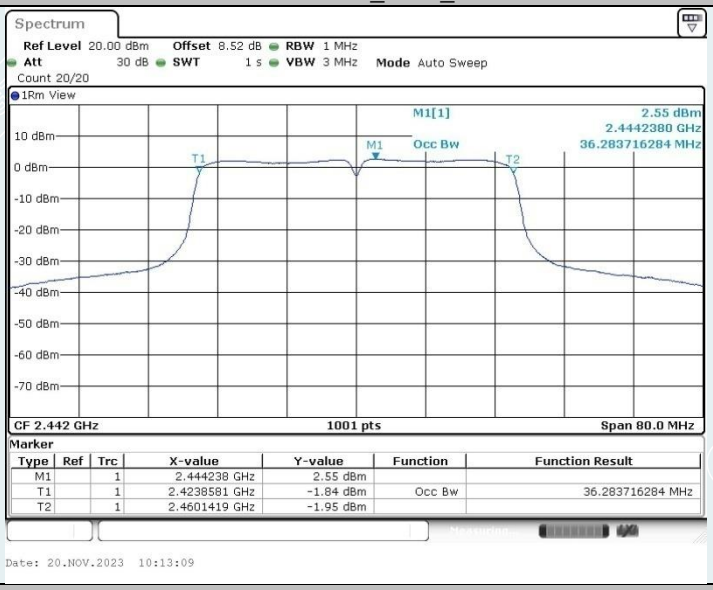
IEEE 802.11n HT20_Ant4_2472MHz



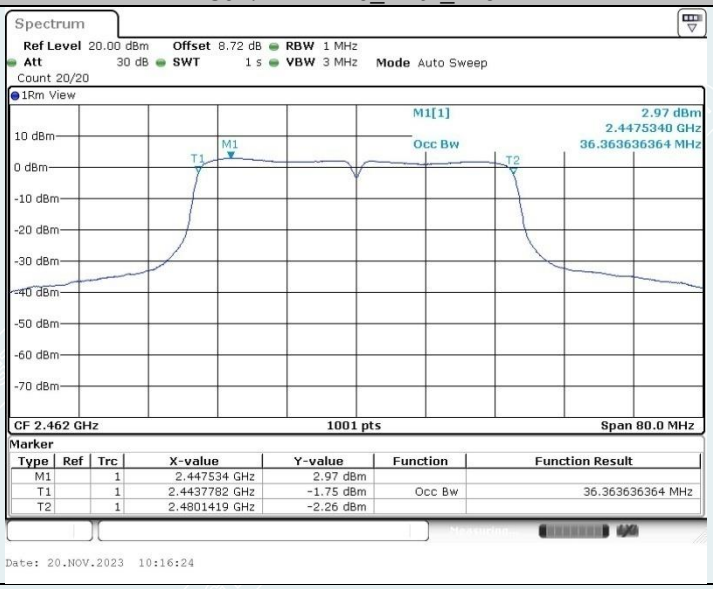
IEEE 802.11n HT40_Ant4_2422MHz



IEEE 802.11n HT40_Ant4_2442MHz



IEEE 802.11n HT40_Ant4_2462MHz



5.5 TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.8

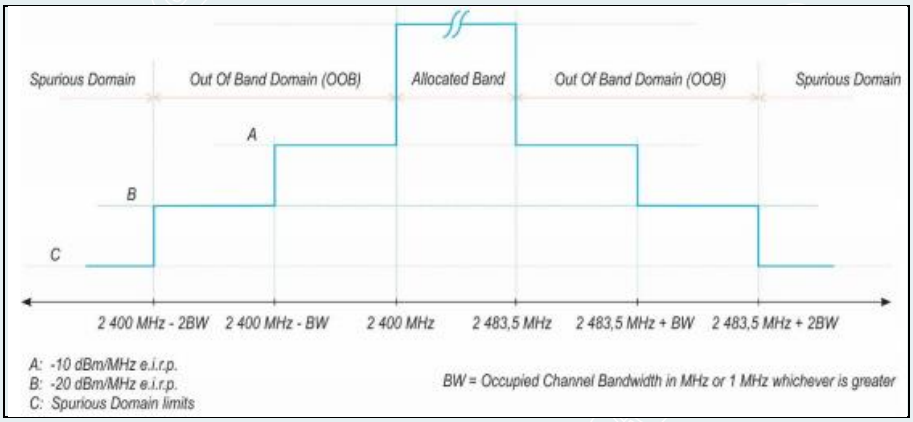
Test Method: ETSI EN300 328 V2.2.2/5.4.8.2.1

5.5.1 LIMIT

This requirement applies to all types of FHSS equipment and all types of non-FHSS equipment.

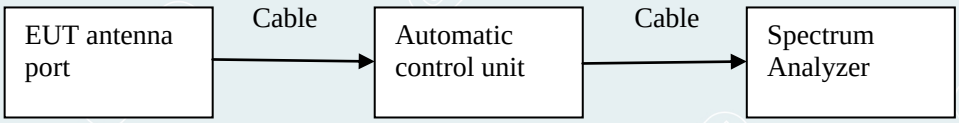
The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 3.

Within the band specified in table 3, the Out-of-band emissions are fulfilled by compliance with the Occupied Channel Bandwidth requirement in clause 6.10.1.1 and 6.10.1.2.



5.5.2 TEST CONFIGURATION

Conducted measurement:



5.5.3 TEST PROCEDURES

Test condition:	Normal test conditions.
Test frequency:	2412MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2462MHz for IEEE 802.11n HT40
Test procedure:	Test procedure is according to Clause 5.4.8.2.1 of ETSI EN 300 328 V2.2.2
Remark:	/

5.5.4 TEST RESULTS

Test environment: Normal condition:

24.1℃/39%RH/101.0kPa

Test Engineer: Huang Tianmei

Test Date: 2023-11-16

Test Voltage: DC 5V

TestMode	Antenna	Freq(MHz)	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
IEEE 802.11b	Ant4	2412	2370.515	-49.63	-20.00	PASS
			2370.53	-49.97	-20.00	PASS
			2371.515	-49.10	-20.00	PASS
			2372.515	-49.26	-20.00	PASS
			2373.515	-49.42	-20.00	PASS
			2374.515	-49.32	-20.00	PASS
			2375.515	-49.63	-20.00	PASS
			2376.515	-49.32	-20.00	PASS
			2377.515	-48.40	-20.00	PASS
			2378.515	-48.79	-20.00	PASS
			2379.515	-48.99	-20.00	PASS
			2380.515	-48.05	-20.00	PASS
			2381.515	-47.55	-20.00	PASS
			2382.515	-47.29	-20.00	PASS
			2383.515	-47.21	-20.00	PASS
			2384.515	-46.31	-20.00	PASS
			2385.5	-46.50	-10.00	PASS
			2385.515	-46.14	-10.00	PASS
			2386.5	-46.01	-10.00	PASS
			2387.5	-44.90	-10.00	PASS
			2388.5	-45.06	-10.00	PASS
			2389.5	-43.77	-10.00	PASS
			2390.5	-44.12	-10.00	PASS
			2391.5	-43.80	-10.00	PASS
			2392.5	-42.94	-10.00	PASS
			2393.5	-41.71	-10.00	PASS
			2394.5	-40.87	-10.00	PASS
			2395.5	-40.36	-10.00	PASS
			2396.5	-37.95	-10.00	PASS
			2397.5	-36.02	-10.00	PASS
			2398.5	-34.73	-10.00	PASS
			2399.5	-33.48	-10.00	PASS
			2484	-50.72	-10.00	PASS
			2485	-50.74	-10.00	PASS
			2486	-50.97	-10.00	PASS
			2487	-43.80	-10.00	PASS
			2488	-54.61	-10.00	PASS
			2489	-53.91	-10.00	PASS
			2490	-54.80	-10.00	PASS
			2491	-55.12	-10.00	PASS
			2492	-55.10	-10.00	PASS
			2493	-54.31	-10.00	PASS
			2494	-54.47	-10.00	PASS
			2495	-54.91	-10.00	PASS
			2496	-54.95	-10.00	PASS

			2497	-54.76	-10.00	PASS
			2497.985	-54.51	-10.00	PASS
			2498	-55.02	-10.00	PASS
			2498.985	-55.06	-20.00	PASS
			2499.985	-55.02	-20.00	PASS
			2500.985	-55.14	-20.00	PASS
			2501.985	-54.60	-20.00	PASS
			2502.985	-54.93	-20.00	PASS
			2503.985	-55.01	-20.00	PASS
			2504.985	-55.13	-20.00	PASS
			2505.985	-55.01	-20.00	PASS
			2506.985	-54.83	-20.00	PASS
			2507.985	-54.85	-20.00	PASS
			2508.985	-55.10	-20.00	PASS
			2509.985	-54.45	-20.00	PASS
			2510.985	-54.79	-20.00	PASS
			2511.985	-54.98	-20.00	PASS
			2512.97	-54.74	-20.00	PASS
			2512.985	-54.72	-20.00	PASS
		2472	2370.29	-51.79	-20.00	PASS
			2370.395	-51.76	-20.00	PASS
			2371.395	-51.45	-20.00	PASS
			2372.395	-51.17	-20.00	PASS
			2373.395	-51.64	-20.00	PASS
			2374.395	-51.15	-20.00	PASS
			2375.395	-51.45	-20.00	PASS
			2376.395	-51.42	-20.00	PASS
			2377.395	-51.68	-20.00	PASS
			2378.395	-51.69	-20.00	PASS
			2379.395	-51.88	-20.00	PASS
			2380.395	-51.27	-20.00	PASS
			2381.395	-50.92	-20.00	PASS
			2382.395	-51.82	-20.00	PASS
			2383.395	-51.38	-20.00	PASS
			2384.395	-51.55	-20.00	PASS
			2385.395	-51.05	-10.00	PASS
			2385.5	-51.48	-10.00	PASS
			2386.5	-51.15	-10.00	PASS
			2387.5	-51.09	-10.00	PASS
			2388.5	-51.07	-10.00	PASS
			2389.5	-50.56	-10.00	PASS
			2390.5	-50.99	-10.00	PASS
			2391.5	-50.91	-10.00	PASS
			2392.5	-50.95	-10.00	PASS
			2393.5	-50.11	-10.00	PASS
			2394.5	-50.85	-10.00	PASS
			2395.5	-50.66	-10.00	PASS
			2396.5	-50.74	-10.00	PASS
			2397.5	-51.00	-10.00	PASS
			2398.5	-51.01	-10.00	PASS
			2399.5	-50.71	-10.00	PASS
			2484	-32.78	-10.00	PASS
			2485	-34.56	-10.00	PASS
			2486	-35.37	-10.00	PASS
			2487	-36.23	-10.00	PASS
			2488	-38.02	-10.00	PASS
			2489	-39.42	-10.00	PASS

			2490	-39.77	-10.00	PASS
			2491	-40.71	-10.00	PASS
			2492	-41.68	-10.00	PASS
			2493	-41.77	-10.00	PASS
			2494	-42.32	-10.00	PASS
			2495	-43.16	-10.00	PASS
			2496	-43.23	-10.00	PASS
			2497	-43.57	-10.00	PASS
			2498	-44.39	-10.00	PASS
			2498.105	-43.78	-10.00	PASS
			2499.105	-44.11	-20.00	PASS
			2500.105	-44.94	-20.00	PASS
			2501.105	-44.97	-20.00	PASS
			2502.105	-45.29	-20.00	PASS
			2503.105	-45.75	-20.00	PASS
			2504.105	-45.53	-20.00	PASS
			2505.105	-45.74	-20.00	PASS
			2506.105	-46.45	-20.00	PASS
			2507.105	-47.09	-20.00	PASS
			2508.105	-47.39	-20.00	PASS
			2509.105	-47.25	-20.00	PASS
			2510.105	-47.40	-20.00	PASS
			2511.105	-48.03	-20.00	PASS
			2512.105	-48.00	-20.00	PASS
			2513.105	-48.19	-20.00	PASS
			2513.21	-47.70	-20.00	PASS
IEEE 802.11g	Ant4	2412	2366.877	-48.09	-20.00	PASS
			2367.254	-48.59	-20.00	PASS
			2367.877	-48.16	-20.00	PASS
			2368.877	-48.30	-20.00	PASS
			2369.877	-47.89	-20.00	PASS
			2370.877	-47.30	-20.00	PASS
			2371.877	-47.75	-20.00	PASS
			2372.877	-46.57	-20.00	PASS
			2373.877	-46.36	-20.00	PASS
			2374.877	-44.81	-20.00	PASS
			2375.877	-45.04	-20.00	PASS
			2376.877	-43.34	-20.00	PASS
			2377.877	-44.21	-20.00	PASS
			2378.877	-42.51	-20.00	PASS
			2379.877	-42.83	-20.00	PASS
			2380.877	-42.20	-20.00	PASS
			2381.877	-42.14	-20.00	PASS
			2382.877	-41.26	-20.00	PASS
			2383.5	-41.30	-10.00	PASS
			2383.877	-39.79	-10.00	PASS
			2384.5	-40.51	-10.00	PASS
			2385.5	-39.94	-10.00	PASS
			2386.5	-38.94	-10.00	PASS
			2387.5	-37.68	-10.00	PASS
			2388.5	-35.16	-10.00	PASS
			2389.5	-34.65	-10.00	PASS
			2390.5	-30.31	-10.00	PASS
			2391.5	-29.70	-10.00	PASS
			2392.5	-28.18	-10.00	PASS
			2393.5	-26.15	-10.00	PASS
			2394.5	-24.90	-10.00	PASS

			2395.5	-22.46	-10.00	PASS
			2396.5	-24.48	-10.00	PASS
			2397.5	-21.88	-10.00	PASS
			2398.5	-21.83	-10.00	PASS
			2399.5	-20.36	-10.00	PASS
			2484	-49.09	-10.00	PASS
			2485	-49.07	-10.00	PASS
			2486	-49.29	-10.00	PASS
			2487	-49.48	-10.00	PASS
			2488	-48.82	-10.00	PASS
			2489	-49.31	-10.00	PASS
			2490	-49.22	-10.00	PASS
			2491	-49.69	-10.00	PASS
			2492	-49.91	-10.00	PASS
			2493	-49.72	-10.00	PASS
			2494	-49.63	-10.00	PASS
			2495	-49.62	-10.00	PASS
			2496	-49.94	-10.00	PASS
			2497	-43.98	-10.00	PASS
			2498	-54.89	-10.00	PASS
			2499	-55.18	-10.00	PASS
			2499.623	-54.79	-10.00	PASS
			2500	-55.12	-10.00	PASS
			2500.623	-54.58	-20.00	PASS
			2501.623	-54.54	-20.00	PASS
			2502.623	-54.86	-20.00	PASS
			2503.623	-55.01	-20.00	PASS
			2504.623	-54.42	-20.00	PASS
			2505.623	-54.82	-20.00	PASS
			2506.623	-54.59	-20.00	PASS
			2507.623	-54.73	-20.00	PASS
			2508.623	-55.01	-20.00	PASS
			2509.623	-54.83	-20.00	PASS
			2510.623	-54.90	-20.00	PASS
			2511.623	-54.65	-20.00	PASS
			2512.623	-54.40	-20.00	PASS
			2513.623	-54.60	-20.00	PASS
			2514.623	-55.00	-20.00	PASS
			2515.623	-54.49	-20.00	PASS
			2516.246	-54.36	-20.00	PASS
			2516.623	-54.48	-20.00	PASS
		2472	2366.837	-51.55	-20.00	PASS
			2367.174	-51.83	-20.00	PASS
			2367.837	-51.55	-20.00	PASS
			2368.837	-51.45	-20.00	PASS
			2369.837	-51.82	-20.00	PASS
			2370.837	-51.80	-20.00	PASS
			2371.837	-51.65	-20.00	PASS
			2372.837	-51.92	-20.00	PASS
			2373.837	-51.80	-20.00	PASS
			2374.837	-51.87	-20.00	PASS
			2375.837	-51.72	-20.00	PASS
			2376.837	-52.05	-20.00	PASS
			2377.837	-51.59	-20.00	PASS
			2378.837	-51.55	-20.00	PASS
			2379.837	-51.34	-20.00	PASS
			2380.837	-51.40	-20.00	PASS

			2381.837	-51.81	-20.00	PASS
			2382.837	-51.51	-20.00	PASS
			2383.5	-51.52	-10.00	PASS
			2383.837	-51.01	-10.00	PASS
			2384.5	-51.24	-10.00	PASS
			2385.5	-51.11	-10.00	PASS
			2386.5	-50.70	-10.00	PASS
			2387.5	-51.20	-10.00	PASS
			2388.5	-50.61	-10.00	PASS
			2389.5	-51.11	-10.00	PASS
			2390.5	-51.13	-10.00	PASS
			2391.5	-50.78	-10.00	PASS
			2392.5	-50.23	-10.00	PASS
			2393.5	-50.57	-10.00	PASS
			2394.5	-50.69	-10.00	PASS
			2395.5	-50.55	-10.00	PASS
			2396.5	-50.37	-10.00	PASS
			2397.5	-50.52	-10.00	PASS
			2398.5	-50.39	-10.00	PASS
			2399.5	-50.20	-10.00	PASS
			2484	-16.72	-10.00	PASS
			2485	-21.69	-10.00	PASS
			2486	-21.67	-10.00	PASS
			2487	-22.04	-10.00	PASS
			2488	-23.24	-10.00	PASS
			2489	-24.55	-10.00	PASS
			2490	-25.14	-10.00	PASS
			2491	-26.34	-10.00	PASS
			2492	-27.68	-10.00	PASS
			2493	-29.73	-10.00	PASS
			2494	-31.55	-10.00	PASS
			2495	-34.47	-10.00	PASS
			2496	-36.85	-10.00	PASS
			2497	-37.37	-10.00	PASS
			2498	-39.27	-10.00	PASS
			2499	-38.22	-10.00	PASS
			2499.663	-38.89	-10.00	PASS
			2500	-38.65	-10.00	PASS
			2500.663	-38.41	-20.00	PASS
			2501.663	-39.28	-20.00	PASS
			2502.663	-39.47	-20.00	PASS
			2503.663	-41.57	-20.00	PASS
			2504.663	-40.91	-20.00	PASS
			2505.663	-43.64	-20.00	PASS
			2506.663	-44.23	-20.00	PASS
			2507.663	-43.77	-20.00	PASS
			2508.663	-44.57	-20.00	PASS
			2509.663	-44.88	-20.00	PASS
			2510.663	-44.80	-20.00	PASS
			2511.663	-44.87	-20.00	PASS
			2512.663	-45.12	-20.00	PASS
			2513.663	-45.53	-20.00	PASS
			2514.663	-45.95	-20.00	PASS
			2515.663	-45.64	-20.00	PASS
			2516.326	-45.87	-20.00	PASS
			2516.663	-46.07	-20.00	PASS
IEEE 802.11n	Ant4	2412	2364.718	-48.32	-20.00	PASS

HT20			2364.936	-48.03	-20.00	PASS
			2365.718	-48.01	-20.00	PASS
			2366.718	-47.68	-20.00	PASS
			2367.718	-46.86	-20.00	PASS
			2368.718	-45.93	-20.00	PASS
			2369.718	-44.56	-20.00	PASS
			2370.718	-44.08	-20.00	PASS
			2371.718	-43.88	-20.00	PASS
			2372.718	-43.62	-20.00	PASS
			2373.718	-43.32	-20.00	PASS
			2374.718	-44.36	-20.00	PASS
			2375.718	-42.35	-20.00	PASS
			2376.718	-41.68	-20.00	PASS
			2377.718	-42.00	-20.00	PASS
			2378.718	-40.77	-20.00	PASS
			2379.718	-39.57	-20.00	PASS
			2380.718	-39.90	-20.00	PASS
			2381.718	-40.89	-20.00	PASS
			2382.5	-40.09	-10.00	PASS
			2382.718	-39.78	-10.00	PASS
			2383.5	-39.31	-10.00	PASS
			2384.5	-39.06	-10.00	PASS
			2385.5	-38.31	-10.00	PASS
			2386.5	-37.04	-10.00	PASS
			2387.5	-34.55	-10.00	PASS
			2388.5	-32.24	-10.00	PASS
			2389.5	-29.13	-10.00	PASS
			2390.5	-27.70	-10.00	PASS
			2391.5	-26.24	-10.00	PASS
			2392.5	-24.58	-10.00	PASS
			2393.5	-23.34	-10.00	PASS
			2394.5	-23.78	-10.00	PASS
			2395.5	-23.61	-10.00	PASS
			2396.5	-22.86	-10.00	PASS
			2397.5	-22.84	-10.00	PASS
			2398.5	-20.12	-10.00	PASS
			2399.5	-19.53	-10.00	PASS
			2484	-48.19	-10.00	PASS
			2485	-48.40	-10.00	PASS
			2486	-48.68	-10.00	PASS
			2487	-48.81	-10.00	PASS
			2488	-48.48	-10.00	PASS
			2489	-48.84	-10.00	PASS
			2490	-49.07	-10.00	PASS
			2491	-49.05	-10.00	PASS
			2492	-49.42	-10.00	PASS
			2493	-49.00	-10.00	PASS
			2494	-49.59	-10.00	PASS
			2495	-49.68	-10.00	PASS
			2496	-49.45	-10.00	PASS
			2497	-49.36	-10.00	PASS
			2498	-49.46	-10.00	PASS
			2499	-49.54	-10.00	PASS
			2500	-49.66	-10.00	PASS
			2500.782	-50.38	-10.00	PASS
			2501	-49.85	-10.00	PASS
			2501.782	-49.26	-20.00	PASS

			2502.782	-50.12	-20.00	PASS
			2503.782	-50.54	-20.00	PASS
			2504.782	-50.27	-20.00	PASS
			2505.782	-50.74	-20.00	PASS
			2506.782	-50.55	-20.00	PASS
			2507.782	-50.77	-20.00	PASS
			2508.782	-50.30	-20.00	PASS
			2509.782	-50.29	-20.00	PASS
			2510.782	-50.78	-20.00	PASS
			2511.782	-50.95	-20.00	PASS
			2512.782	-50.89	-20.00	PASS
			2513.782	-50.99	-20.00	PASS
			2514.782	-50.40	-20.00	PASS
			2515.782	-51.10	-20.00	PASS
			2516.782	-50.86	-20.00	PASS
			2517.782	-50.96	-20.00	PASS
			2518.564	-51.37	-20.00	PASS
			2518.782	-50.86	-20.00	PASS
		2472	2364.718	-51.81	-20.00	PASS
			2364.936	-51.34	-20.00	PASS
			2365.718	-51.63	-20.00	PASS
			2366.718	-52.31	-20.00	PASS
			2367.718	-51.63	-20.00	PASS
			2368.718	-52.06	-20.00	PASS
			2369.718	-51.36	-20.00	PASS
			2370.718	-51.87	-20.00	PASS
			2371.718	-51.92	-20.00	PASS
			2372.718	-52.28	-20.00	PASS
			2373.718	-51.65	-20.00	PASS
			2374.718	-51.61	-20.00	PASS
			2375.718	-51.67	-20.00	PASS
			2376.718	-51.66	-20.00	PASS
			2377.718	-51.77	-20.00	PASS
			2378.718	-51.72	-20.00	PASS
			2379.718	-51.41	-20.00	PASS
			2380.718	-51.34	-20.00	PASS
			2381.718	-51.21	-20.00	PASS
			2382.5	-51.95	-10.00	PASS
			2382.718	-51.67	-10.00	PASS
			2383.5	-51.49	-10.00	PASS
			2384.5	-51.14	-10.00	PASS
			2385.5	-51.18	-10.00	PASS
			2386.5	-50.94	-10.00	PASS
			2387.5	-50.98	-10.00	PASS
			2388.5	-50.73	-10.00	PASS
			2389.5	-51.01	-10.00	PASS
			2390.5	-50.98	-10.00	PASS
			2391.5	-50.51	-10.00	PASS
			2392.5	-50.70	-10.00	PASS
			2393.5	-50.07	-10.00	PASS
			2394.5	-50.74	-10.00	PASS
			2395.5	-50.72	-10.00	PASS
			2396.5	-50.86	-10.00	PASS
			2397.5	-50.32	-10.00	PASS
			2398.5	-51.02	-10.00	PASS
			2399.5	-50.64	-10.00	PASS
			2484	-19.16	-10.00	PASS

			2485	-20.45	-10.00	PASS
			2486	-22.74	-10.00	PASS
			2487	-22.70	-10.00	PASS
			2488	-24.51	-10.00	PASS
			2489	-23.58	-10.00	PASS
			2490	-24.33	-10.00	PASS
			2491	-25.77	-10.00	PASS
			2492	-27.58	-10.00	PASS
			2493	-28.58	-10.00	PASS
			2494	-29.24	-10.00	PASS
			2495	-32.04	-10.00	PASS
			2496	-33.01	-10.00	PASS
			2497	-35.39	-10.00	PASS
			2498	-37.76	-10.00	PASS
			2499	-39.57	-10.00	PASS
			2500	-39.34	-10.00	PASS
			2500.782	-39.54	-10.00	PASS
			2501	-40.58	-10.00	PASS
			2501.782	-40.23	-20.00	PASS
			2502.782	-41.52	-20.00	PASS
			2503.782	-41.56	-20.00	PASS
			2504.782	-41.98	-20.00	PASS
			2505.782	-43.05	-20.00	PASS
			2506.782	-43.93	-20.00	PASS
			2507.782	-44.23	-20.00	PASS
			2508.782	-44.72	-20.00	PASS
			2509.782	-44.86	-20.00	PASS
			2510.782	-44.90	-20.00	PASS
			2511.782	-44.73	-20.00	PASS
			2512.782	-45.59	-20.00	PASS
			2513.782	-45.45	-20.00	PASS
			2514.782	-45.58	-20.00	PASS
			2515.782	-46.05	-20.00	PASS
			2516.782	-46.05	-20.00	PASS
			2517.782	-46.43	-20.00	PASS
			2518.564	-46.10	-20.00	PASS
			2518.782	-46.66	-20.00	PASS
IEEE 802.11n HT40	Ant4	2422	2327.772	-50.93	-20.00	PASS
			2328.136	-51.07	-20.00	PASS
			2329.136	-50.99	-20.00	PASS
			2330.136	-51.34	-20.00	PASS
			2331.136	-50.71	-20.00	PASS
			2332.136	-50.87	-20.00	PASS
			2333.136	-50.73	-20.00	PASS
			2334.136	-50.35	-20.00	PASS
			2335.136	-50.18	-20.00	PASS
			2336.136	-50.10	-20.00	PASS
			2337.136	-50.11	-20.00	PASS
			2338.136	-48.86	-20.00	PASS
			2339.136	-49.31	-20.00	PASS
			2340.136	-48.88	-20.00	PASS
			2341.136	-48.94	-20.00	PASS
			2342.136	-48.53	-20.00	PASS
			2343.136	-48.57	-20.00	PASS
			2344.136	-47.93	-20.00	PASS
			2345.136	-47.52	-20.00	PASS
			2346.136	-47.44	-20.00	PASS

			2347.136	-47.32	-20.00	PASS
			2348.136	-47.09	-20.00	PASS
			2349.136	-46.27	-20.00	PASS
			2350.136	-46.56	-20.00	PASS
			2351.136	-46.62	-20.00	PASS
			2352.136	-46.17	-20.00	PASS
			2353.136	-45.07	-20.00	PASS
			2354.136	-45.90	-20.00	PASS
			2355.136	-45.60	-20.00	PASS
			2356.136	-44.69	-20.00	PASS
			2357.136	-45.25	-20.00	PASS
			2358.136	-44.51	-20.00	PASS
			2359.136	-44.71	-20.00	PASS
			2360.136	-44.06	-20.00	PASS
			2361.136	-44.42	-20.00	PASS
			2362.136	-43.22	-20.00	PASS
			2363.136	-43.01	-20.00	PASS
			2364.136	-41.27	-10.00	PASS
			2364.5	-40.23	-10.00	PASS
			2365.5	-41.77	-10.00	PASS
			2366.5	-42.03	-10.00	PASS
			2367.5	-41.99	-10.00	PASS
			2368.5	-40.88	-10.00	PASS
			2369.5	-40.48	-10.00	PASS
			2370.5	-38.75	-10.00	PASS
			2371.5	-38.56	-10.00	PASS
			2372.5	-37.41	-10.00	PASS
			2373.5	-36.25	-10.00	PASS
			2374.5	-34.92	-10.00	PASS
			2375.5	-34.45	-10.00	PASS
			2376.5	-32.45	-10.00	PASS
			2377.5	-34.54	-10.00	PASS
			2378.5	-33.14	-10.00	PASS
			2379.5	-31.53	-10.00	PASS
			2380.5	-31.02	-10.00	PASS
			2381.5	-31.21	-10.00	PASS
			2382.5	-31.21	-10.00	PASS
			2383.5	-28.97	-10.00	PASS
			2384.5	-27.90	-10.00	PASS
			2385.5	-27.63	-10.00	PASS
			2386.5	-28.00	-10.00	PASS
			2387.5	-27.42	-10.00	PASS
			2388.5	-26.41	-10.00	PASS
			2389.5	-27.09	-10.00	PASS
			2390.5	-26.96	-10.00	PASS
			2391.5	-27.00	-10.00	PASS
			2392.5	-26.84	-10.00	PASS
			2393.5	-25.60	-10.00	PASS
			2394.5	-25.80	-10.00	PASS
			2395.5	-24.45	-10.00	PASS
			2396.5	-24.12	-10.00	PASS
			2397.5	-24.44	-10.00	PASS
			2398.5	-22.87	-10.00	PASS
			2399.5	-21.81	-10.00	PASS
			2484	-43.09	-10.00	PASS
			2485	-42.80	-10.00	PASS
			2486	-43.39	-10.00	PASS

			2487	-43.97	-10.00	PASS
			2488	-42.89	-10.00	PASS
			2489	-44.01	-10.00	PASS
			2490	-43.70	-10.00	PASS
			2491	-44.18	-10.00	PASS
			2492	-45.38	-10.00	PASS
			2493	-45.55	-10.00	PASS
			2494	-44.30	-10.00	PASS
			2495	-45.68	-10.00	PASS
			2496	-46.07	-10.00	PASS
			2497	-45.69	-10.00	PASS
			2498	-46.22	-10.00	PASS
			2499	-45.43	-10.00	PASS
			2500	-45.68	-10.00	PASS
			2501	-47.28	-10.00	PASS
			2502	-45.13	-10.00	PASS
			2503	-47.90	-10.00	PASS
			2504	-47.30	-10.00	PASS
			2505	-46.39	-10.00	PASS
			2506	-48.69	-10.00	PASS
			2507	-49.05	-10.00	PASS
			2508	-48.67	-10.00	PASS
			2509	-49.06	-10.00	PASS
			2510	-48.87	-10.00	PASS
			2511	-50.11	-10.00	PASS
			2512	-49.74	-10.00	PASS
			2513	-49.45	-10.00	PASS
			2514	-50.99	-10.00	PASS
			2515	-50.82	-10.00	PASS
			2516	-51.28	-10.00	PASS
			2517	-51.63	-10.00	PASS
			2518	-51.36	-10.00	PASS
			2519	-51.13	-10.00	PASS
			2519.364	-51.39	-10.00	PASS
			2520.364	-51.54	-20.00	PASS
			2521.364	-51.62	-20.00	PASS
			2522.364	-51.77	-20.00	PASS
			2523.364	-52.12	-20.00	PASS
			2524.364	-52.13	-20.00	PASS
			2525.364	-51.76	-20.00	PASS
			2526.364	-51.79	-20.00	PASS
			2527.364	-52.28	-20.00	PASS
			2528.364	-51.64	-20.00	PASS
			2529.364	-51.26	-20.00	PASS
			2530.364	-52.03	-20.00	PASS
			2531.364	-51.97	-20.00	PASS
			2532.364	-52.27	-20.00	PASS
			2533.364	-52.02	-20.00	PASS
			2534.364	-51.81	-20.00	PASS
			2535.364	-51.69	-20.00	PASS
			2536.364	-51.63	-20.00	PASS
			2537.364	-51.84	-20.00	PASS
			2538.364	-51.83	-20.00	PASS
			2539.364	-52.21	-20.00	PASS
			2540.364	-51.64	-20.00	PASS
			2541.364	-52.14	-20.00	PASS
			2542.364	-51.69	-20.00	PASS

			2543.364	-52.26	-20.00	PASS
			2544.364	-52.21	-20.00	PASS
			2545.364	-52.25	-20.00	PASS
			2546.364	-52.39	-20.00	PASS
			2547.364	-51.95	-20.00	PASS
			2548.364	-52.12	-20.00	PASS
			2549.364	-52.01	-20.00	PASS
			2550.364	-52.42	-20.00	PASS
			2551.364	-51.97	-20.00	PASS
			2552.364	-52.07	-20.00	PASS
			2553.364	-52.24	-20.00	PASS
			2554.364	-52.29	-20.00	PASS
			2555.364	-52.32	-20.00	PASS
			2555.728	-51.97	-20.00	PASS
		2462	2327.772	-51.72	-20.00	PASS
			2328.136	-52.00	-20.00	PASS
			2329.136	-52.15	-20.00	PASS
			2330.136	-52.45	-20.00	PASS
			2331.136	-52.42	-20.00	PASS
			2332.136	-51.98	-20.00	PASS
			2333.136	-52.46	-20.00	PASS
			2334.136	-52.27	-20.00	PASS
			2335.136	-52.46	-20.00	PASS
			2336.136	-51.48	-20.00	PASS
			2337.136	-52.16	-20.00	PASS
			2338.136	-51.92	-20.00	PASS
			2339.136	-52.34	-20.00	PASS
			2340.136	-52.25	-20.00	PASS
			2341.136	-52.05	-20.00	PASS
			2342.136	-51.60	-20.00	PASS
			2343.136	-52.21	-20.00	PASS
			2344.136	-51.75	-20.00	PASS
			2345.136	-52.19	-20.00	PASS
			2346.136	-51.75	-20.00	PASS
			2347.136	-51.85	-20.00	PASS
			2348.136	-51.78	-20.00	PASS
			2349.136	-51.67	-20.00	PASS
			2350.136	-51.79	-20.00	PASS
			2351.136	-51.64	-20.00	PASS
			2352.136	-51.95	-20.00	PASS
			2353.136	-51.72	-20.00	PASS
			2354.136	-51.83	-20.00	PASS
			2355.136	-51.92	-20.00	PASS
			2356.136	-51.68	-20.00	PASS
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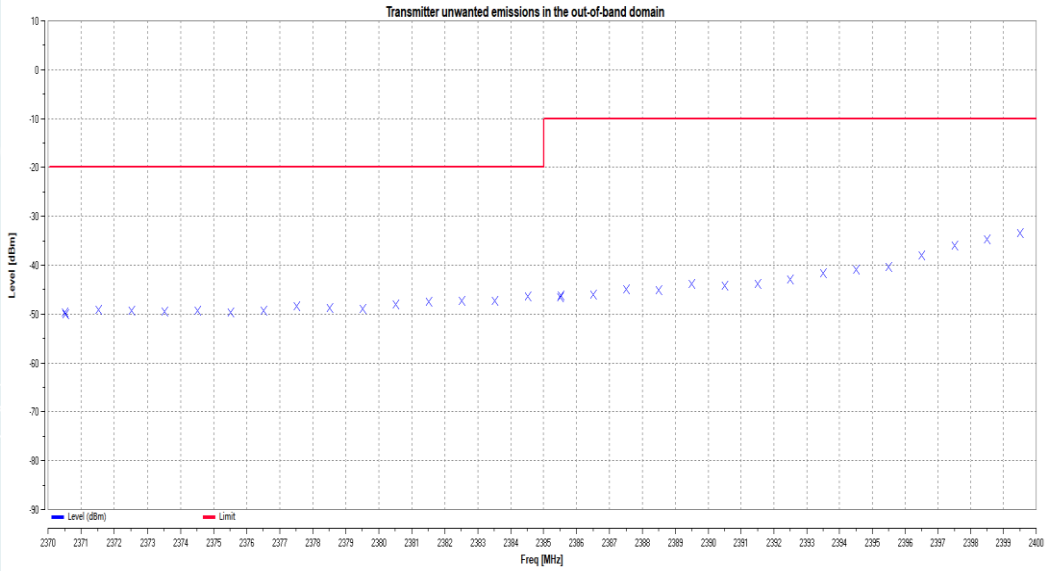
			2358.136	-51.35	-20.00	PASS
			2359.136	-51.66	-20.00	PASS
			2360.136	-50.93	-20.00	PASS
			2361.136	-51.67	-20.00	PASS
			2362.136	-51.71	-20.00	PASS
			2363.136	-51.58	-20.00	PASS
			2364.136	-51.21	-10.00	PASS
			2364.5	-51.31	-10.00	PASS
			2365.5	-51.24	-10.00	PASS
			2366.5	-50.86	-10.00	PASS
			2367.5	-50.64	-10.00	PASS
			2368.5	-51.06	-10.00	PASS

			2369.5	-50.22	-10.00	PASS
			2370.5	-50.01	-10.00	PASS
			2371.5	-49.50	-10.00	PASS
			2372.5	-50.04	-10.00	PASS
			2373.5	-49.57	-10.00	PASS
			2374.5	-49.42	-10.00	PASS
			2375.5	-50.20	-10.00	PASS
			2376.5	-50.16	-10.00	PASS
			2377.5	-50.08	-10.00	PASS
			2378.5	-50.26	-10.00	PASS
			2379.5	-50.28	-10.00	PASS
			2380.5	-49.67	-10.00	PASS
			2381.5	-49.73	-10.00	PASS
			2382.5	-49.91	-10.00	PASS
			2383.5	-48.87	-10.00	PASS
			2384.5	-49.20	-10.00	PASS
			2385.5	-48.03	-10.00	PASS
			2386.5	-48.04	-10.00	PASS
			2387.5	-47.15	-10.00	PASS
			2388.5	-47.62	-10.00	PASS
			2389.5	-47.18	-10.00	PASS
			2390.5	-46.87	-10.00	PASS
			2391.5	-46.88	-10.00	PASS
			2392.5	-47.27	-10.00	PASS
			2393.5	-47.55	-10.00	PASS
			2394.5	-46.01	-10.00	PASS
			2395.5	-46.70	-10.00	PASS
			2396.5	-46.05	-10.00	PASS
			2397.5	-44.68	-10.00	PASS
			2398.5	-44.02	-10.00	PASS
			2399.5	-45.32	-10.00	PASS
			2484	-22.97	-10.00	PASS
			2485	-23.29	-10.00	PASS
			2486	-23.24	-10.00	PASS
			2487	-25.37	-10.00	PASS
			2488	-25.90	-10.00	PASS
			2489	-25.20	-10.00	PASS
			2490	-24.42	-10.00	PASS
			2491	-25.34	-10.00	PASS
			2492	-26.94	-10.00	PASS
			2493	-26.97	-10.00	PASS
			2494	-27.33	-10.00	PASS
			2495	-27.51	-10.00	PASS
			2496	-27.25	-10.00	PASS
			2497	-27.57	-10.00	PASS
			2498	-28.32	-10.00	PASS
			2499	-28.43	-10.00	PASS
			2500	-28.58	-10.00	PASS
			2501	-28.29	-10.00	PASS
			2502	-30.76	-10.00	PASS
			2503	-31.37	-10.00	PASS
			2504	-32.58	-10.00	PASS
			2505	-32.35	-10.00	PASS
			2506	-33.25	-10.00	PASS
			2507	-34.27	-10.00	PASS
			2508	-33.94	-10.00	PASS
			2509	-36.14	-10.00	PASS

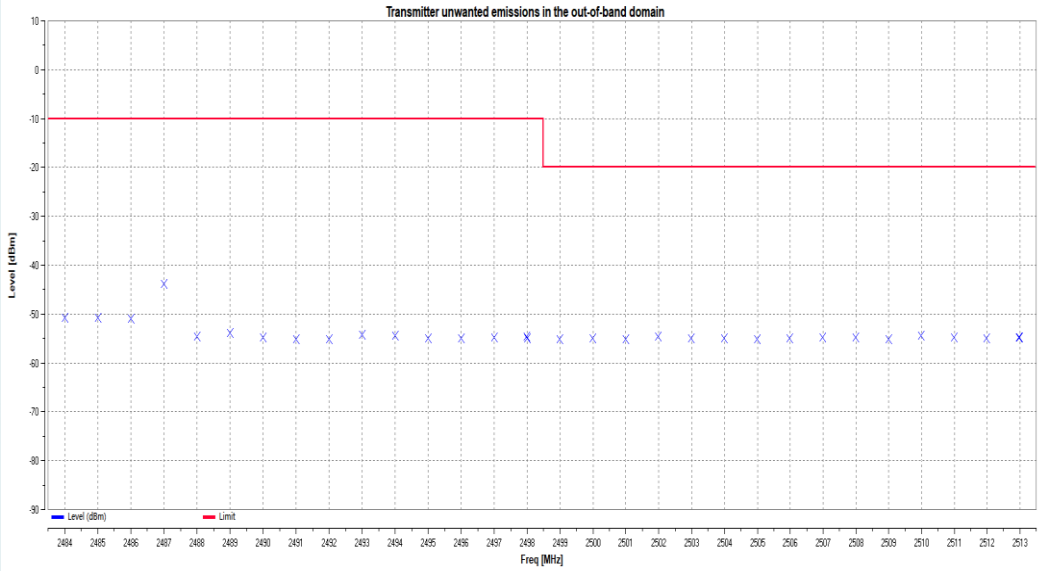
			2510	-35.01	-10.00	PASS
			2511	-37.89	-10.00	PASS
			2512	-37.76	-10.00	PASS
			2513	-40.08	-10.00	PASS
			2514	-38.19	-10.00	PASS
			2515	-39.91	-10.00	PASS
			2516	-39.60	-10.00	PASS
			2517	-40.80	-10.00	PASS
			2518	-40.44	-10.00	PASS
			2519	-41.55	-10.00	PASS
			2519.364	-42.20	-10.00	PASS
			2520.364	-42.16	-20.00	PASS
			2521.364	-43.00	-20.00	PASS
			2522.364	-43.98	-20.00	PASS
			2523.364	-41.88	-20.00	PASS
			2524.364	-44.33	-20.00	PASS
			2525.364	-43.82	-20.00	PASS
			2526.364	-43.40	-20.00	PASS
			2527.364	-44.62	-20.00	PASS
			2528.364	-43.36	-20.00	PASS
			2529.364	-45.94	-20.00	PASS
			2530.364	-46.11	-20.00	PASS
			2531.364	-46.86	-20.00	PASS
			2532.364	-47.22	-20.00	PASS
			2533.364	-46.87	-20.00	PASS
			2534.364	-47.19	-20.00	PASS
			2535.364	-47.77	-20.00	PASS
			2536.364	-48.06	-20.00	PASS
			2537.364	-47.93	-20.00	PASS
			2538.364	-49.05	-20.00	PASS
			2539.364	-47.21	-20.00	PASS
			2540.364	-49.01	-20.00	PASS
			2541.364	-49.95	-20.00	PASS
			2542.364	-49.92	-20.00	PASS
			2543.364	-50.28	-20.00	PASS
			2544.364	-50.06	-20.00	PASS
			2545.364	-49.16	-20.00	PASS
			2546.364	-50.02	-20.00	PASS
			2547.364	-51.00	-20.00	PASS
			2548.364	-50.93	-20.00	PASS
			2549.364	-51.08	-20.00	PASS
			2550.364	-50.27	-20.00	PASS
			2551.364	-51.36	-20.00	PASS
			2552.364	-51.48	-20.00	PASS
			2553.364	-50.70	-20.00	PASS
			2554.364	-51.52	-20.00	PASS
			2555.364	-50.86	-20.00	PASS
			2555.728	-51.39	-20.00	PASS

Test Graphs

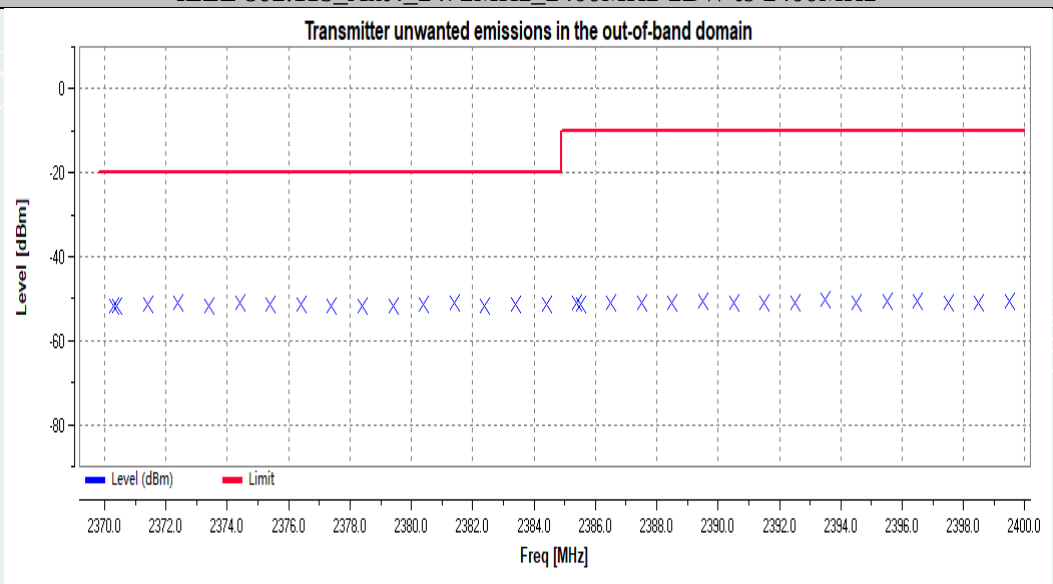
IEEE 802.11b_Ant4_2412MHz_2400MHz-2BW to 2400MHz



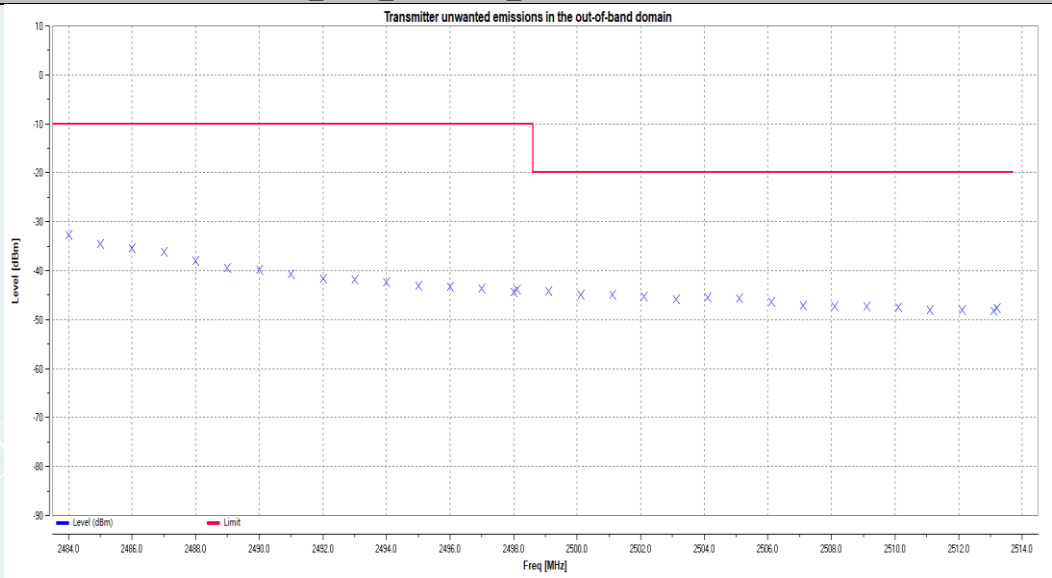
IEEE 802.11b_Ant4_2412MHz_2483.5MHz to 2483.5MHz+2BW



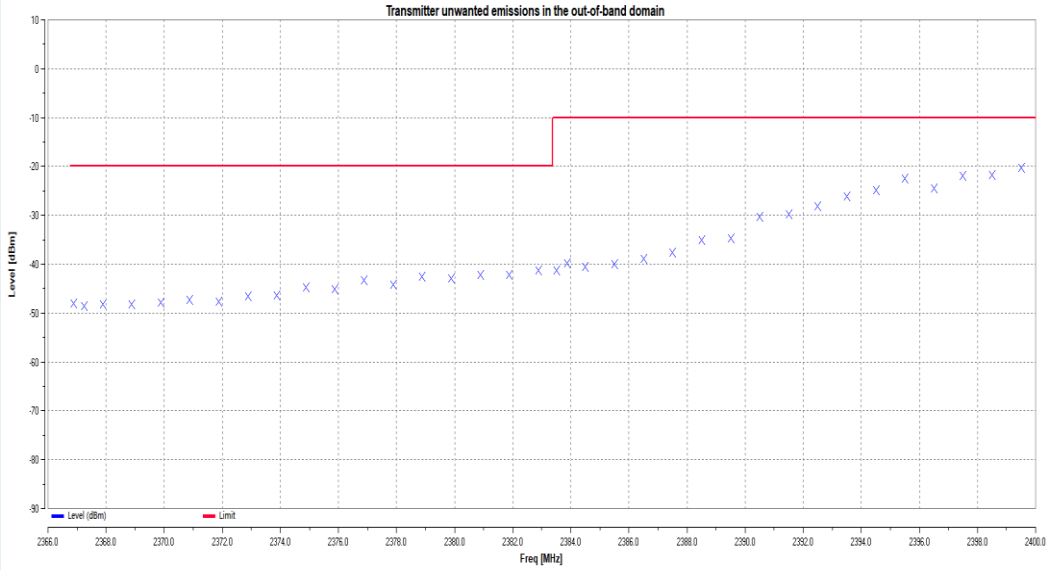
IEEE 802.11b_Ant4_2472MHz_2400MHz-2BW to 2400MHz



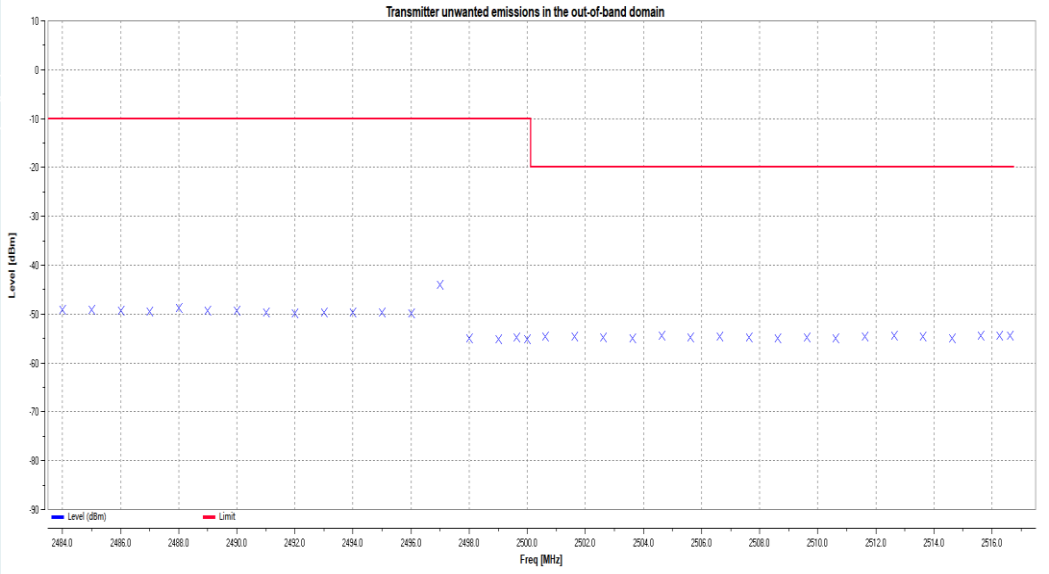
IEEE 802.11b_Ant4_2472MHz_2483.5MHz to 2483.5MHz+2BW



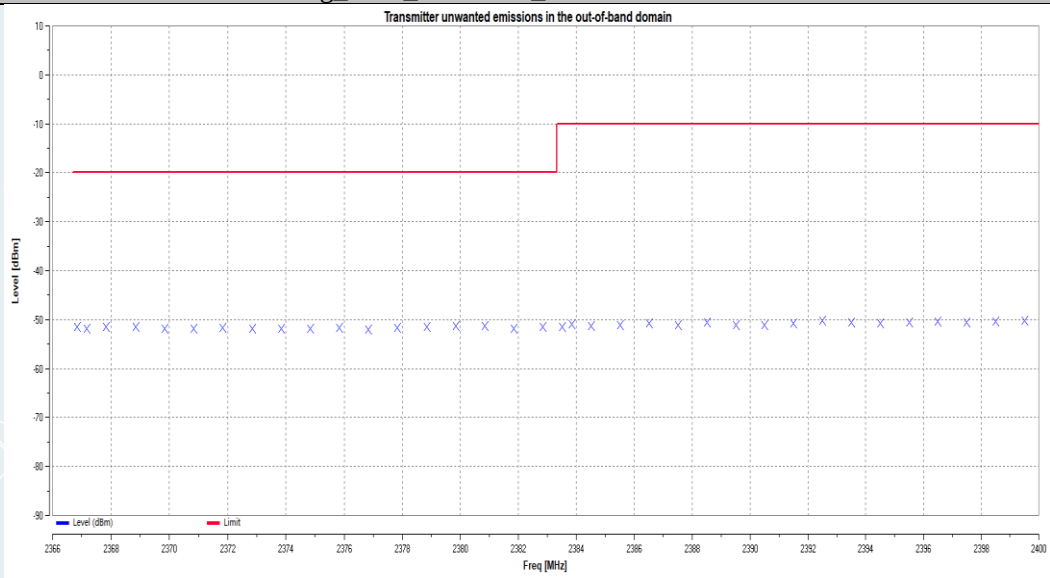
IEEE 802.11g_Ant4_2412MHz_2400MHz-2BW to 2400MHz



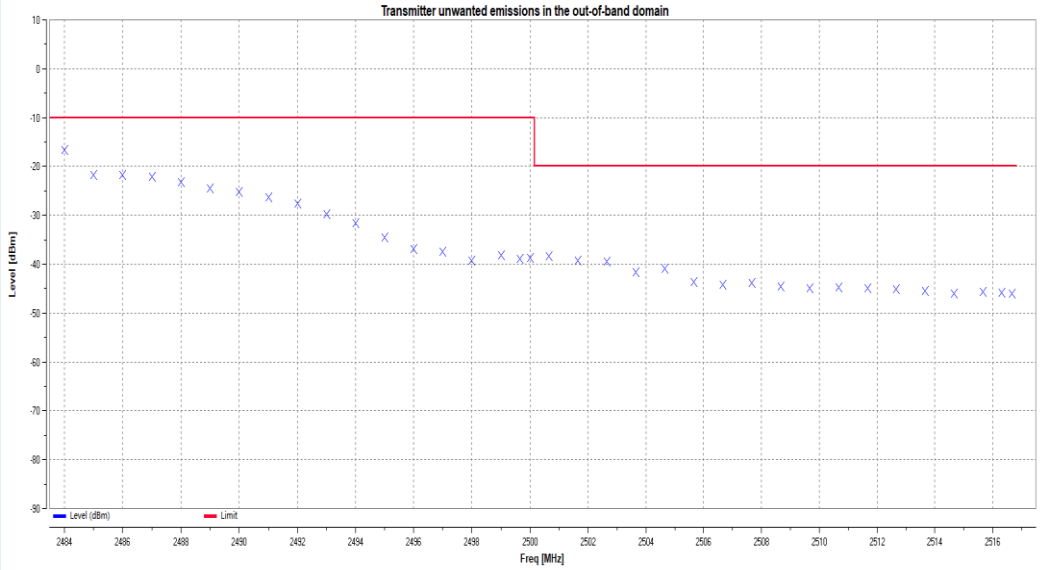
IEEE 802.11g_Ant4_2412MHz_2483.5MHz to 2483.5MHz+2BW



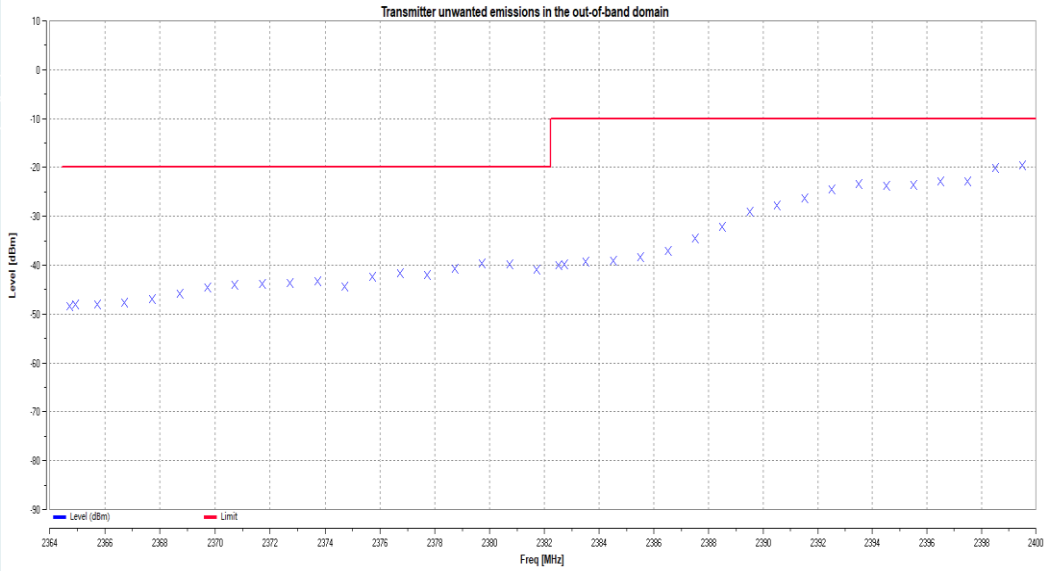
IEEE 802.11g_Ant4_2472MHz_2400MHz-2BW to 2400MHz



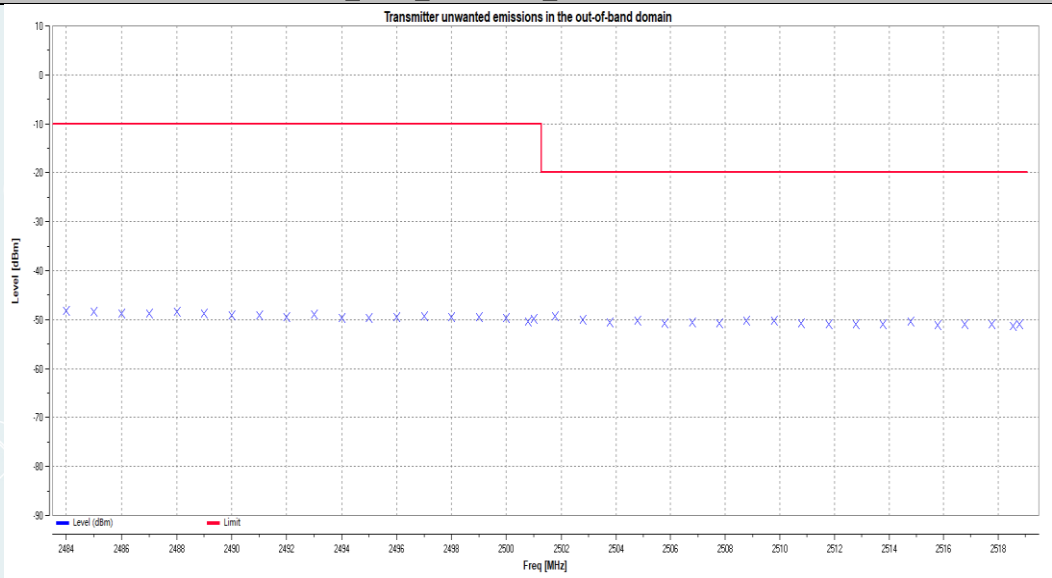
IEEE 802.11g_Ant4_2472MHz_2483.5MHz to 2483.5MHz+2BW



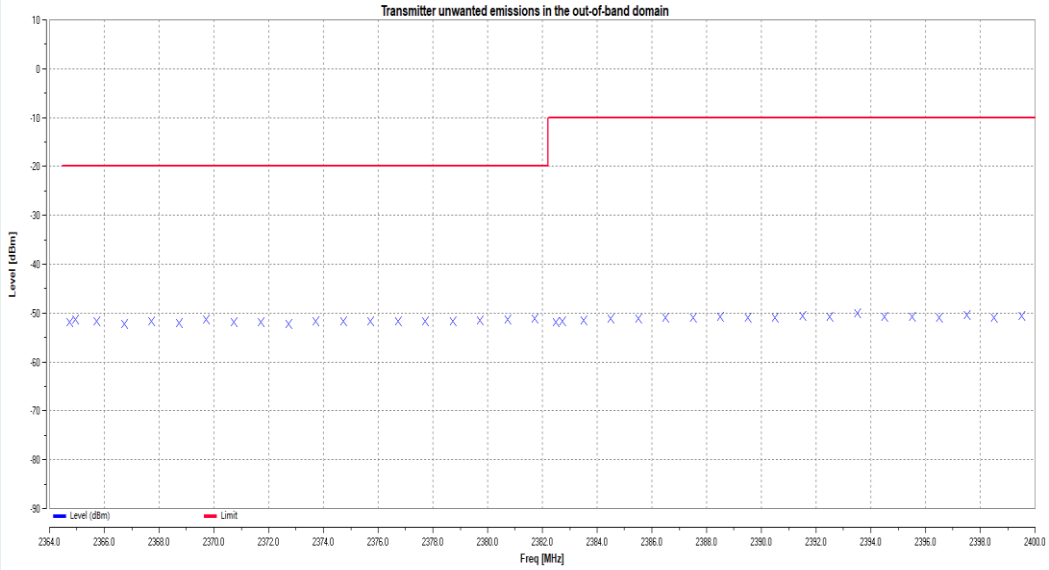
IEEE 802.11n HT20_Ant4_2412MHz_2400MHz-2BW to 2400MHz



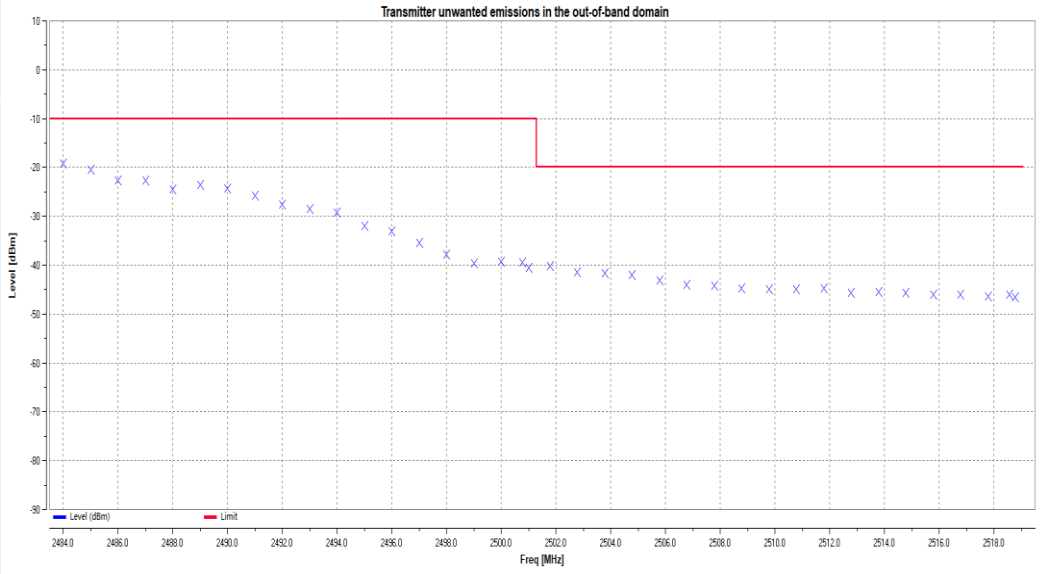
IEEE 802.11n HT20_Ant4_2412MHz_2483.5MHz to 2483.5MHz+2BW



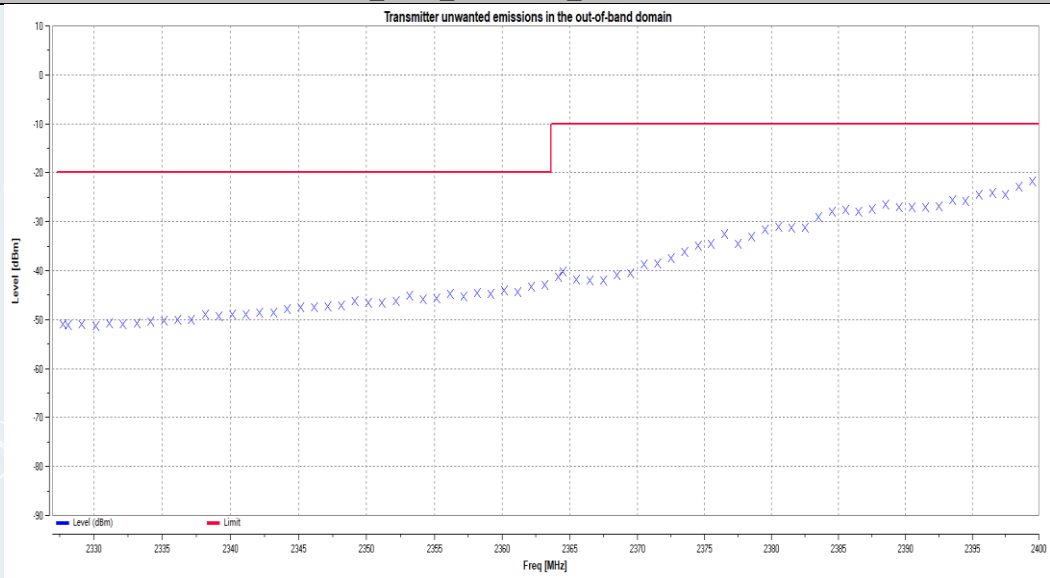
IEEE 802.11n HT20_Ant4_2472MHz_2400MHz-2BW to 2400MHz



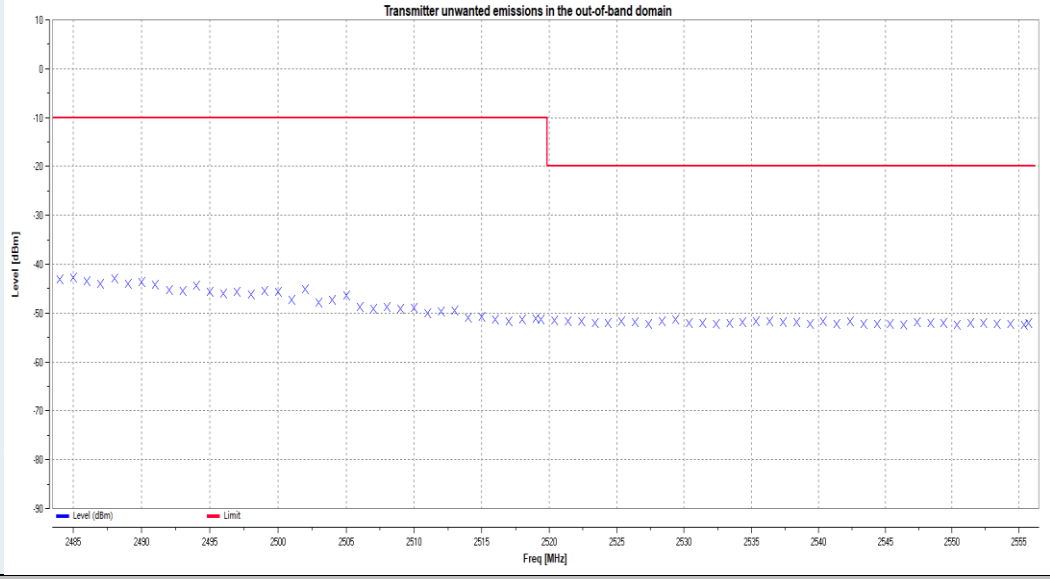
IEEE 802.11n HT20_Ant4_2472MHz_2483.5MHz to 2483.5MHz+2BW



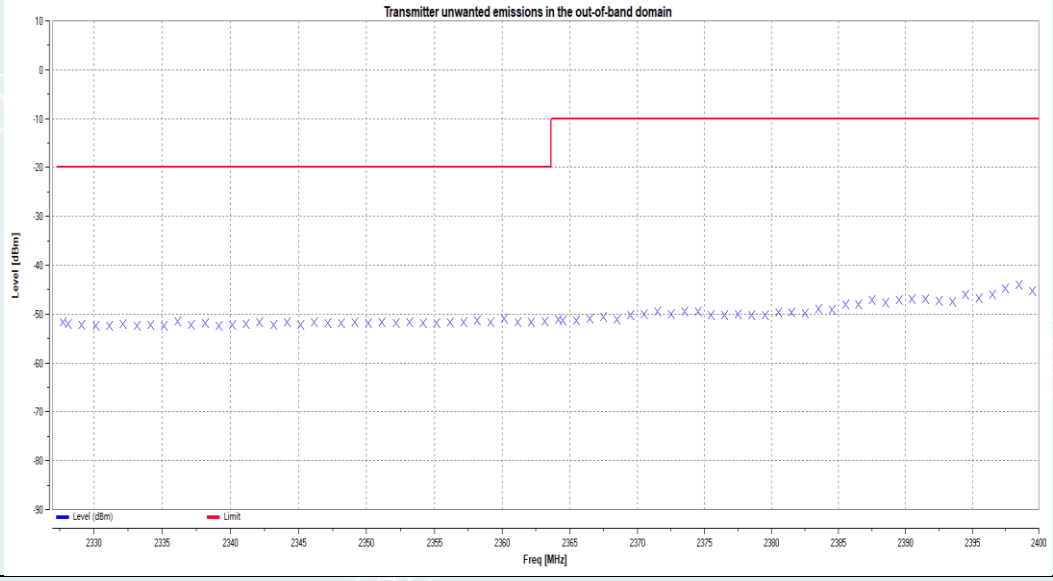
IEEE 802.11n HT40_Ant4_2422MHz_2400MHz-2BW to 2400MHz

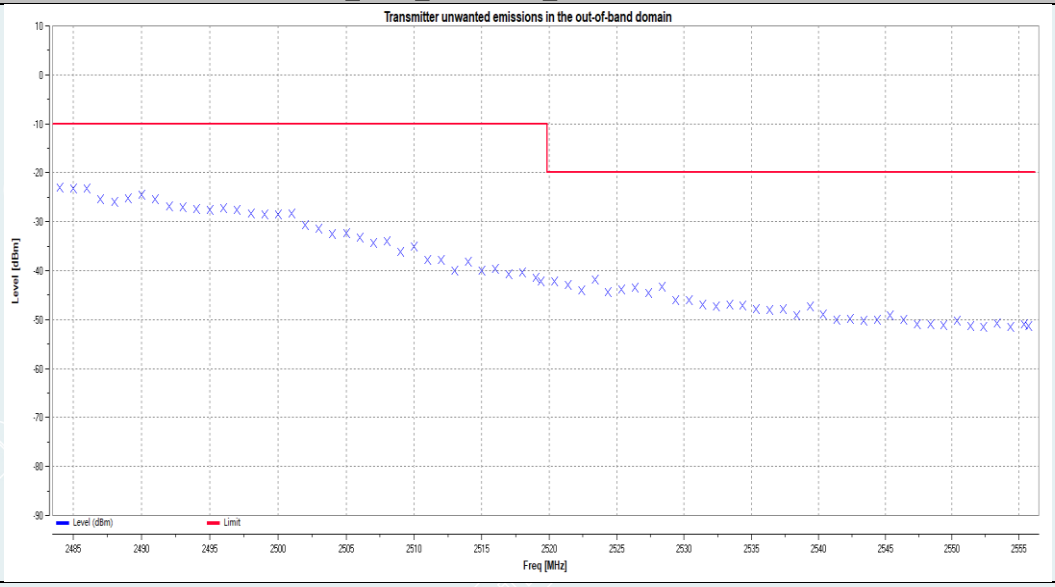


IEEE 802.11n HT40_Ant4_2422MHz_2483.5MHz to 2483.5MHz+2BW



IEEE 802.11n HT40_Ant4_2462MHz_2400MHz-2BW to 2400MHz



IEEE 802.11n HT40_Ant4_2462MHz_2483.5MHz to 2483.5MHz+2BW


---------- The following blanks ----------

5.6 TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.9

Test Method: ETSI EN300 328 V2.2.2/5.4.9.2.2

5.6.1 LIMIT

This requirement applies to all types of FHSS equipment and all types of non-FHSS equipment.

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 2. In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

Note: This test uses conducted emissions measurement and Radiated emissions measurement.

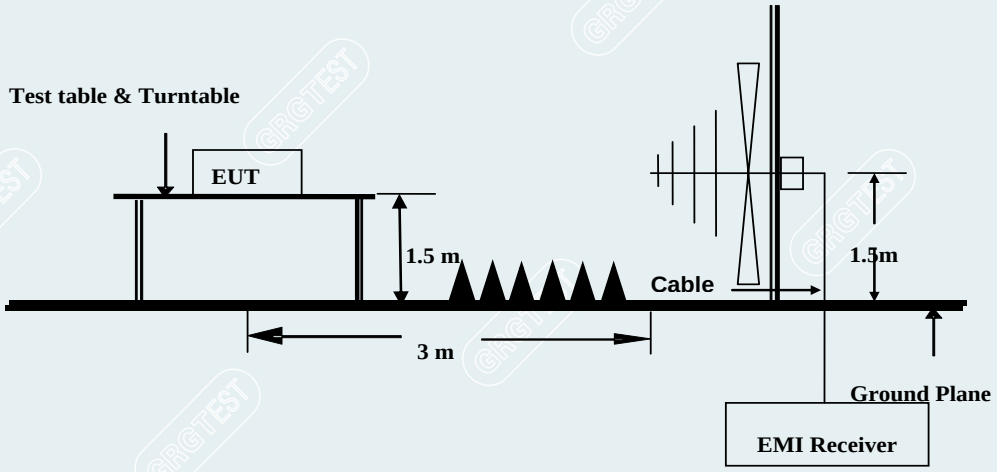
Table 2: Transmitter limits for spurious emissions

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

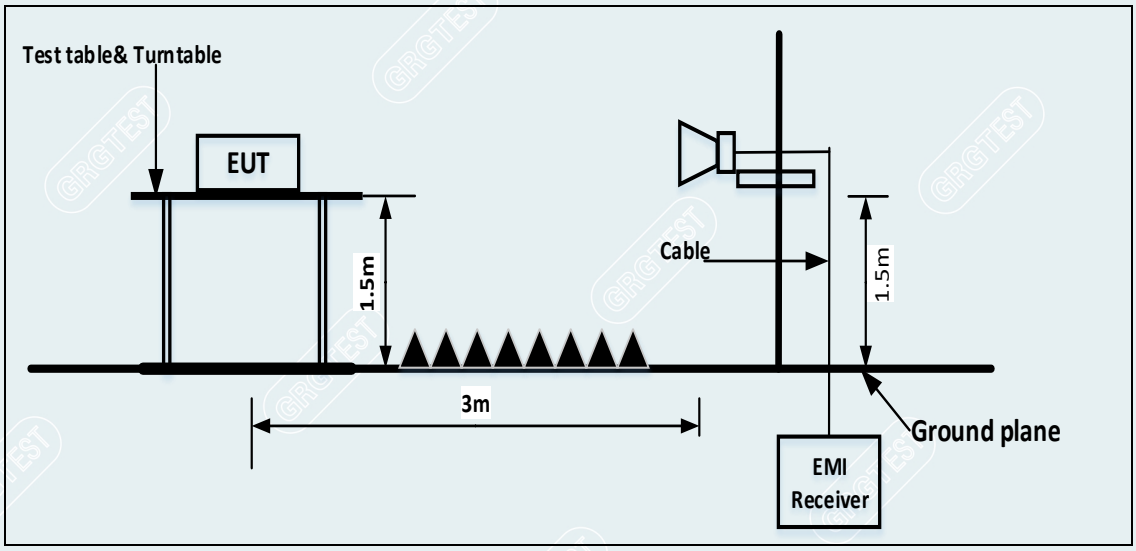
---------- The following blanks ----------

5.6.2 TEST CONFIGURATION

30MHz~1000MHz



1000MHz~12750MHz



5.6.3 TEST PROCEDURES

Test condition:	Normal test conditions.
Test frequency:	2412MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2462MHz for IEEE 802.11n HT40
Test procedure:	Test procedure is according to Clause 5.4.9.2.1 of ETSI EN 300 328 V2.2.2

5.6.4 DATA SAMPLE

Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
XXX	-49.71	-57.90	-30.00	27.90	-8.19	RMS	Horizontal

Frequency (MHz) = Emission frequency in MHz

Reading (dBm) = Uncorrected Analyzer / Receiver reading

Level (dBm) = Reading (dBm) + Factor (dB)

Limit (dBm) = Limit stated in standard

Margin (dB) = Limit (dBm) – Level (dBm)

RMS = Root Mean Square

---------- **The following blanks** ----------

5.6.5 TEST RESULTS

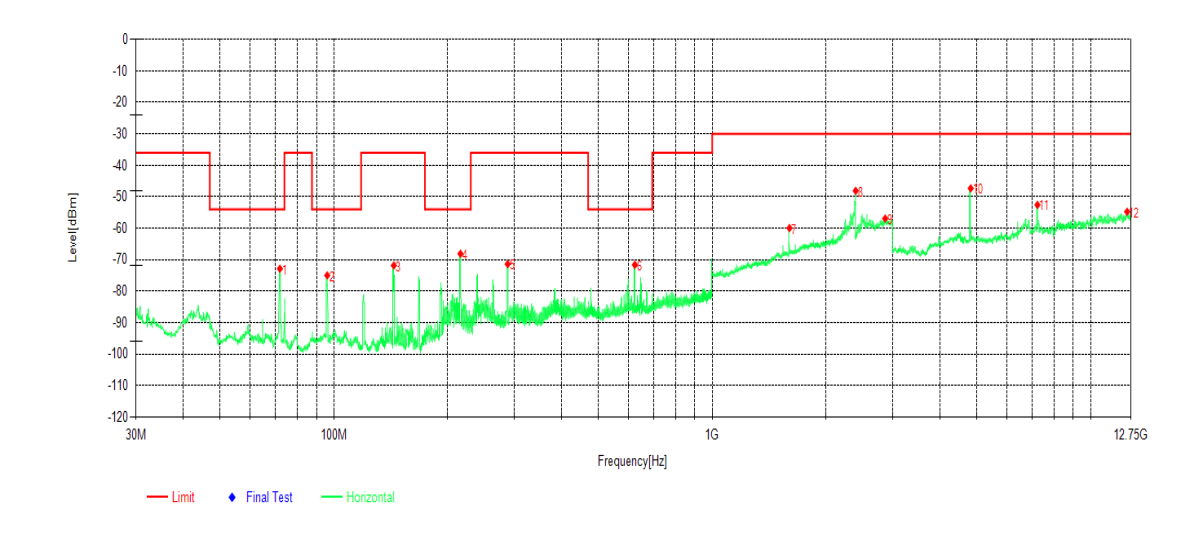
Pre-scan all modes, the worst power supply is AC 230/50Hz (DC 5V/2A power by Adapter), in the two power supply modes, 1GHz-12.75GHz data only record the worst power supply mode (DC 5V/2A power by Adapter) and 30MHz-1GHz records the data of two power supply modes (DC 5V/2A power by Adapter & DC 48V/0.27A power by PoE Adapter) in this report.

Power supply: AC 230V/50Hz(DC 5V/2A power by Adapter)

30MHz-12.75GHz

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11b 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

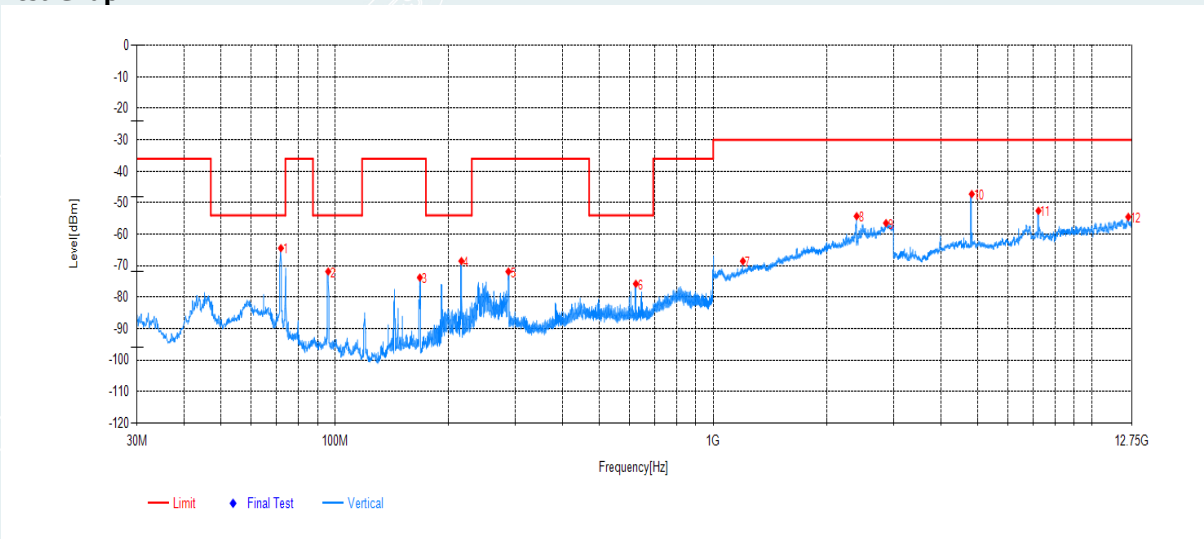
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-51.28	-72.84	-54.00	18.84	-21.56	RMS	Horizontal
2	96.057	-58.11	-74.97	-54.00	20.97	-16.86	RMS	Horizontal
3	143.975	-52.50	-71.83	-36.00	35.83	-19.33	RMS	Horizontal
4	216.046	-50.76	-68.08	-54.00	14.08	-17.32	RMS	Horizontal
5	288.02	-57.24	-71.38	-36.00	35.38	-14.14	RMS	Horizontal
6	624.319	-63.43	-71.60	-54.00	17.60	-8.17	RMS	Horizontal
7	1600	-64.33	-59.94	-30.00	29.94	4.39	RMS	Horizontal
8	2394	-57.69	-48.10	-30.00	18.10	9.59	RMS	Horizontal
9	2864.6	-70.10	-56.90	-30.00	26.90	13.20	RMS	Horizontal
10	4823.25	-45.60	-47.31	-30.00	17.31	-1.71	RMS	Horizontal
11	7237.35	-57.37	-52.56	-30.00	22.56	4.81	RMS	Horizontal
12	12494.55	-69.30	-54.76	-30.00	24.76	14.54	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11b 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

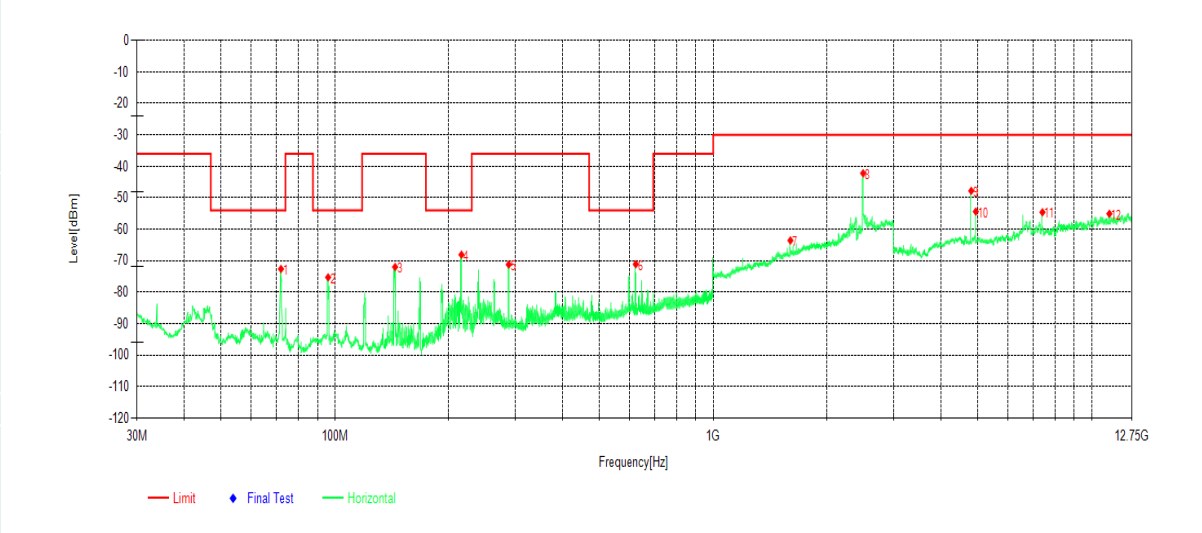
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-45.72	-64.40	-54.00	10.40	-18.68	RMS	Vertical
2	96.057	-52.51	-71.82	-54.00	17.82	-19.31	RMS	Vertical
3	167.74	-55.89	-73.75	-36.00	37.75	-17.86	RMS	Vertical
4	215.949	-50.98	-68.50	-54.00	14.50	-17.52	RMS	Vertical
5	287.632	-57.29	-71.84	-36.00	35.84	-14.55	RMS	Vertical
6	624.513	-67.68	-75.72	-54.00	21.72	-8.04	RMS	Vertical
7	1198	-68.78	-68.52	-30.00	38.52	0.26	RMS	Vertical
8	2393.6	-63.97	-54.23	-30.00	24.23	9.74	RMS	Vertical
9	2862.8	-70.00	-56.45	-30.00	26.45	13.55	RMS	Vertical
10	4823.25	-45.71	-47.22	-30.00	17.22	-1.51	RMS	Vertical
11	7237.35	-57.30	-52.52	-30.00	22.52	4.78	RMS	Vertical
12	12502.35	-69.32	-54.47	-30.00	24.47	14.85	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11b 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

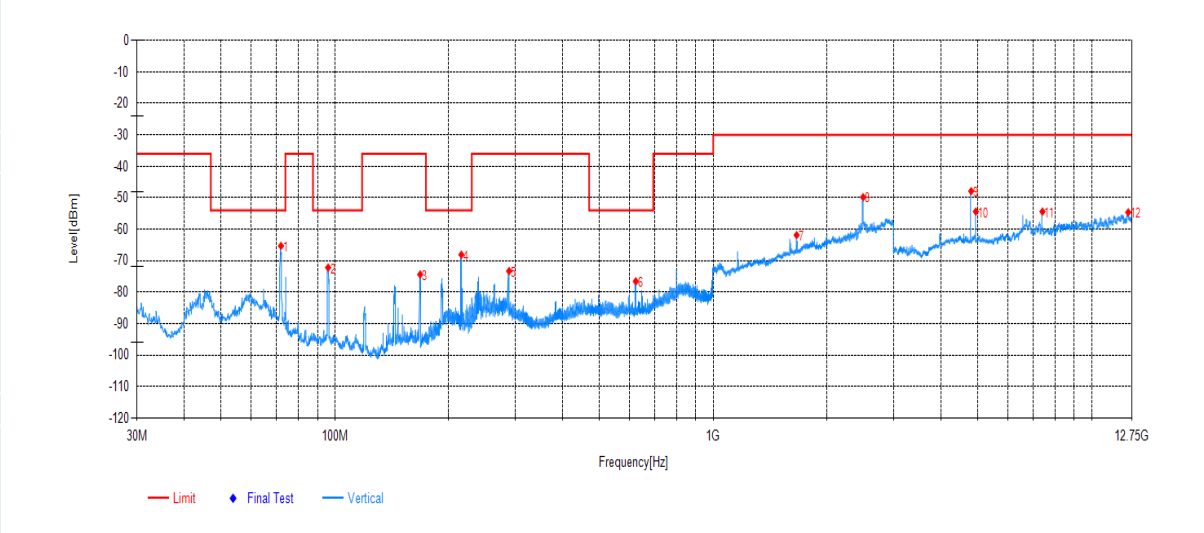
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-51.05	-72.61	-54.00	18.61	-21.56	RMS	Horizontal
2	95.96	-58.41	-75.27	-54.00	21.27	-16.86	RMS	Horizontal
3	144.266	-52.59	-71.98	-36.00	35.98	-19.39	RMS	Horizontal
4	216.046	-50.73	-68.05	-54.00	14.05	-17.32	RMS	Horizontal
5	288.02	-57.05	-71.19	-36.00	35.19	-14.14	RMS	Horizontal
6	624.028	-62.94	-71.11	-54.00	17.11	-8.17	RMS	Horizontal
7	1600	-67.94	-63.55	-30.00	33.55	4.39	RMS	Horizontal
8	2489.6	-54.58	-42.23	-30.00	12.23	12.35	RMS	Horizontal
9	4806.675	-45.83	-47.79	-30.00	17.79	-1.96	RMS	Horizontal
10	4944.15	-53.47	-54.38	-30.00	24.38	-0.91	RMS	Horizontal
11	7417.725	-59.54	-54.57	-30.00	24.57	4.97	RMS	Horizontal
12	11145.15	-67.93	-55.07	-30.00	25.07	12.86	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11b 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

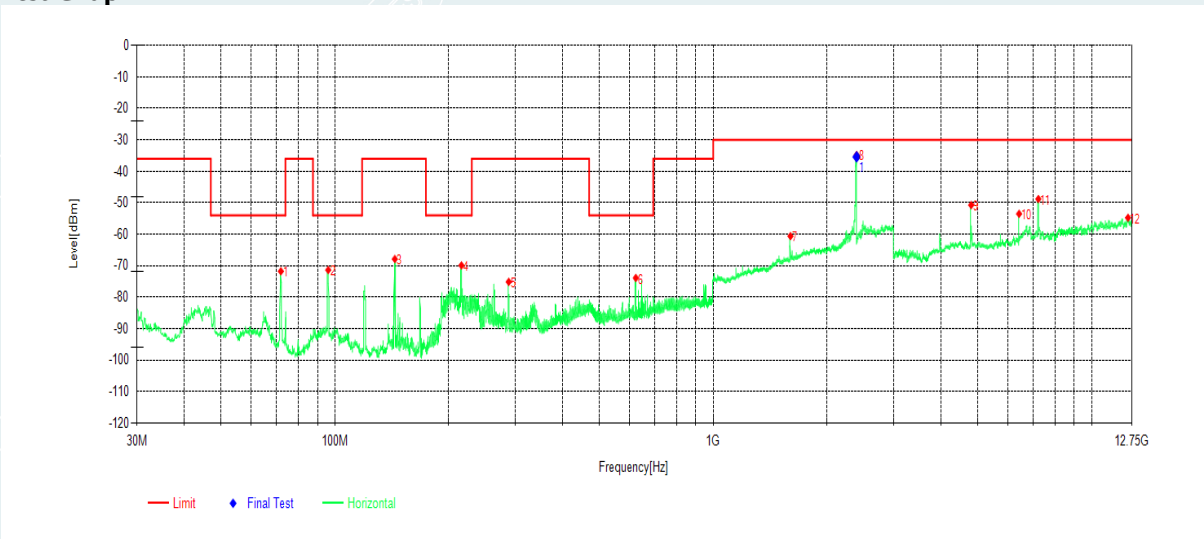
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-46.60	-65.28	-54.00	11.28	-18.68	RMS	Vertical
2	95.96	-52.85	-72.16	-54.00	18.16	-19.31	RMS	Vertical
3	168.031	-56.47	-74.34	-36.00	38.34	-17.87	RMS	Vertical
4	215.949	-50.53	-68.05	-54.00	14.05	-17.52	RMS	Vertical
5	288.602	-58.75	-73.28	-36.00	37.28	-14.53	RMS	Vertical
6	624.125	-68.48	-76.54	-54.00	22.54	-8.06	RMS	Vertical
7	1661.6	-66.52	-61.86	-30.00	31.86	4.66	RMS	Vertical
8	2489.6	-62.28	-49.78	-30.00	19.78	12.50	RMS	Vertical
9	4806.675	-46.16	-47.90	-30.00	17.90	-1.74	RMS	Vertical
10	4944.15	-53.59	-54.36	-30.00	24.36	-0.77	RMS	Vertical
11	7416.75	-59.45	-54.40	-30.00	24.40	5.05	RMS	Vertical
12	12502.35	-69.43	-54.58	-30.00	24.58	14.85	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11g 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph

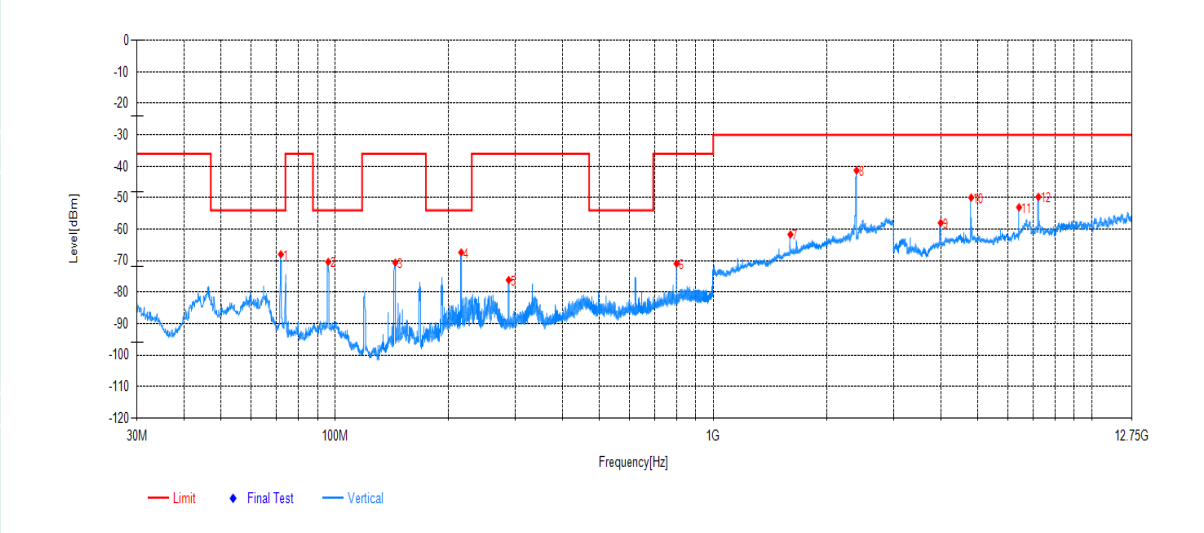


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-50.19	-71.75	-54.00	17.75	-21.56	RMS	Horizontal
2	96.057	-54.48	-71.34	-54.00	17.34	-16.86	RMS	Horizontal
3	143.975	-48.53	-67.86	-36.00	31.86	-19.33	RMS	Horizontal
4	216.046	-52.56	-69.88	-54.00	15.88	-17.32	RMS	Horizontal
5	288.02	-60.97	-75.11	-36.00	39.11	-14.14	RMS	Horizontal
6	624.222	-65.71	-73.88	-54.00	19.88	-8.17	RMS	Horizontal
7	1600.2	-64.96	-60.57	-30.00	30.57	4.39	RMS	Horizontal
8	2393	-44.33	-34.78	-30.00	4.78	9.55	RMS	Horizontal
9	4806.675	-48.77	-50.73	-30.00	20.73	-1.96	RMS	Horizontal
10	6432	-55.65	-53.49	-30.00	23.49	2.16	RMS	Horizontal
11	7233.45	-53.64	-48.81	-30.00	18.81	4.83	RMS	Horizontal
12	12487.725	-69.15	-54.76	-30.00	24.76	14.39	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	2393	-44.96	-35.41	-30.00	5.41	9.55	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11g 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

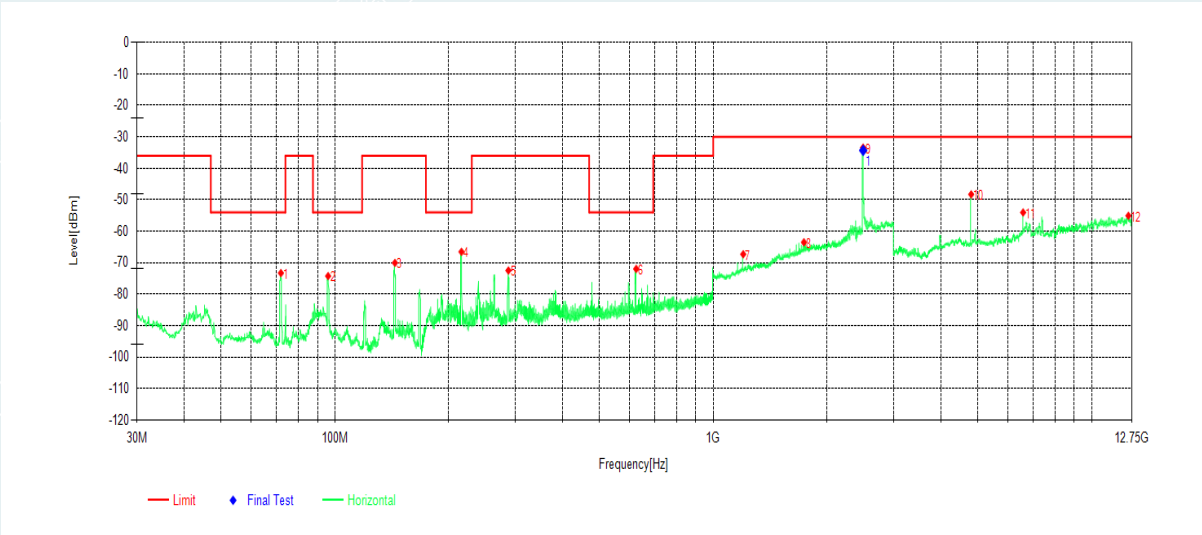
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-49.28	-67.96	-54.00	13.96	-18.68	RMS	Vertical
2	96.057	-51.03	-70.34	-54.00	16.34	-19.31	RMS	Vertical
3	144.46	-51.34	-70.59	-36.00	34.59	-19.25	RMS	Vertical
4	215.658	-49.86	-67.38	-54.00	13.38	-17.52	RMS	Vertical
5	288.117	-61.58	-76.12	-36.00	40.12	-14.54	RMS	Vertical
6	799.986	-65.52	-70.93	-36.00	34.93	-5.41	RMS	Vertical
7	1600	-66.42	-61.64	-30.00	31.64	4.78	RMS	Vertical
8	2393.4	-51.04	-41.30	-30.00	11.30	9.74	RMS	Vertical
9	3992.55	-54.48	-57.96	-30.00	27.96	-3.48	RMS	Vertical
10	4806.675	-48.16	-49.90	-30.00	19.90	-1.74	RMS	Vertical
11	6432	-55.19	-53.02	-30.00	23.02	2.17	RMS	Vertical
12	7240.275	-54.44	-49.68	-30.00	19.68	4.76	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11g 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph

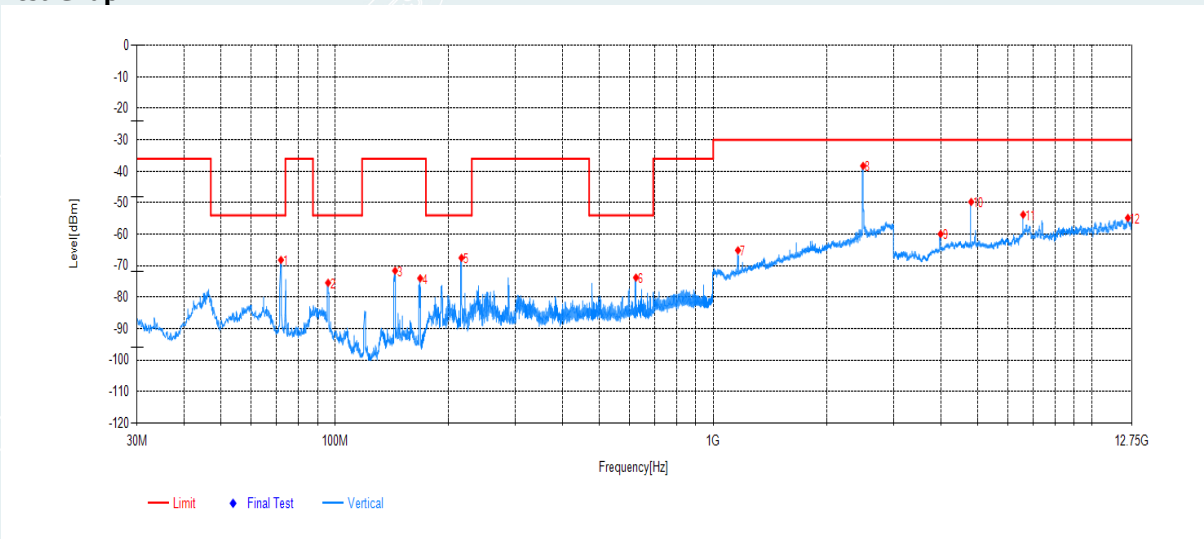


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-51.72	-73.28	-54.00	19.28	-21.56	RMS	Horizontal
2	95.96	-57.36	-74.22	-54.00	20.22	-16.86	RMS	Horizontal
3	144.072	-50.68	-70.03	-36.00	34.03	-19.35	RMS	Horizontal
4	216.046	-49.19	-66.51	-54.00	12.51	-17.32	RMS	Horizontal
5	287.632	-58.30	-72.45	-36.00	36.45	-14.15	RMS	Horizontal
6	625.871	-63.81	-71.95	-54.00	17.95	-8.14	RMS	Horizontal
7	1200	-67.08	-67.30	-30.00	37.30	-0.22	RMS	Horizontal
8	1736.4	-69.49	-63.49	-30.00	33.49	6.00	RMS	Horizontal
9	2490.4	-45.71	-33.40	-30.00	3.40	12.31	RMS	Horizontal
10	4806.675	-46.32	-48.28	-30.00	18.28	-1.96	RMS	Horizontal
11	6591.9	-57.62	-54.01	-30.00	24.01	3.61	RMS	Horizontal
12	12515.025	-69.47	-55.06	-30.00	25.06	14.41	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	2490.4	-46.62	-34.31	-30.00	4.31	12.31	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11g 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

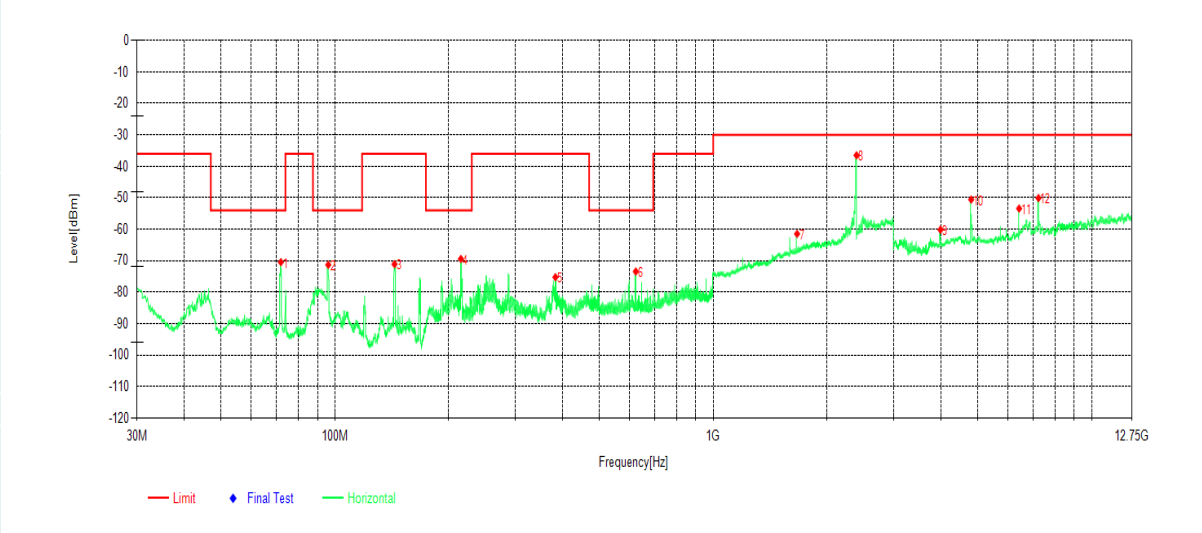
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-49.48	-68.16	-54.00	14.16	-18.68	RMS	Vertical
2	95.96	-56.10	-75.41	-54.00	21.41	-19.31	RMS	Vertical
3	144.266	-52.33	-71.59	-36.00	35.59	-19.26	RMS	Vertical
4	168.128	-56.13	-74.00	-36.00	38.00	-17.87	RMS	Vertical
5	216.046	-49.97	-67.49	-54.00	13.49	-17.52	RMS	Vertical
6	624.804	-65.74	-73.77	-54.00	19.77	-8.03	RMS	Vertical
7	1162.2	-64.36	-65.10	-30.00	35.10	-0.74	RMS	Vertical
8	2489.4	-50.75	-38.25	-30.00	8.25	12.50	RMS	Vertical
9	3991.575	-56.41	-59.91	-30.00	29.91	-3.50	RMS	Vertical
10	4806.675	-47.99	-49.73	-30.00	19.73	-1.74	RMS	Vertical
11	6591.9	-57.71	-53.76	-30.00	23.76	3.95	RMS	Vertical
12	12478.95	-69.18	-54.81	-30.00	24.81	14.37	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

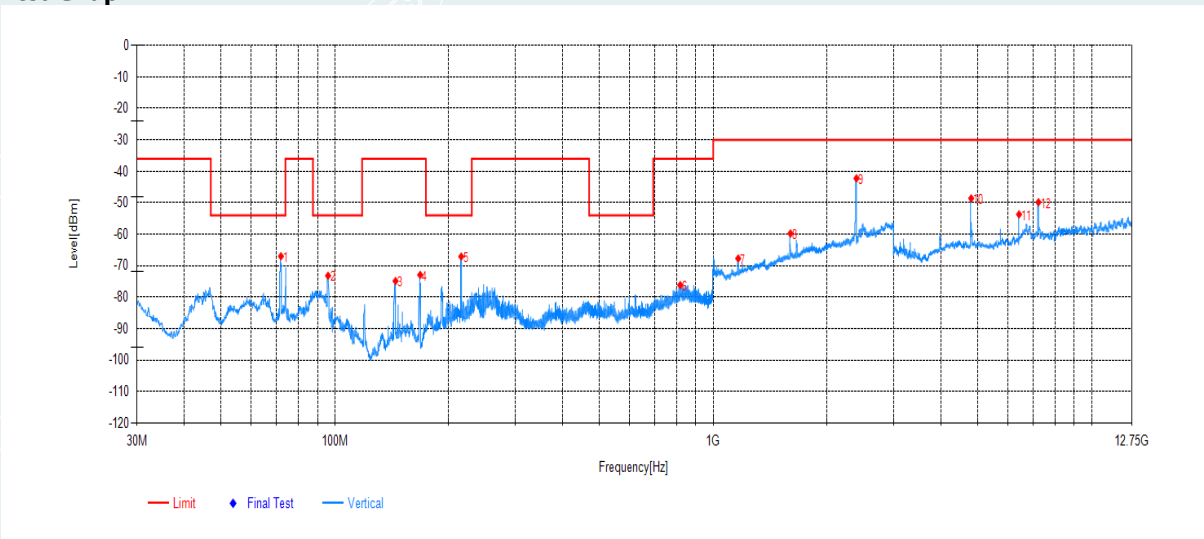
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-48.89	-70.45	-54.00	16.45	-21.56	RMS	Horizontal
2	96.057	-54.44	-71.30	-54.00	17.30	-16.86	RMS	Horizontal
3	143.781	-51.78	-71.07	-36.00	35.07	-19.29	RMS	Horizontal
4	215.27	-52.07	-69.42	-54.00	15.42	-17.35	RMS	Horizontal
5	382.692	-63.17	-75.22	-36.00	39.22	-12.05	RMS	Horizontal
6	624.028	-65.24	-73.41	-54.00	19.41	-8.17	RMS	Horizontal
7	1665.8	-65.97	-61.46	-30.00	31.46	4.51	RMS	Horizontal
8	2392	-46.00	-36.48	-30.00	6.48	9.52	RMS	Horizontal
9	3986.7	-56.21	-60.12	-30.00	30.12	-3.91	RMS	Horizontal
10	4806.675	-48.59	-50.55	-30.00	20.55	-1.96	RMS	Horizontal
11	6432	-55.57	-53.41	-30.00	23.41	2.16	RMS	Horizontal
12	7237.35	-54.88	-50.07	-30.00	20.07	4.81	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

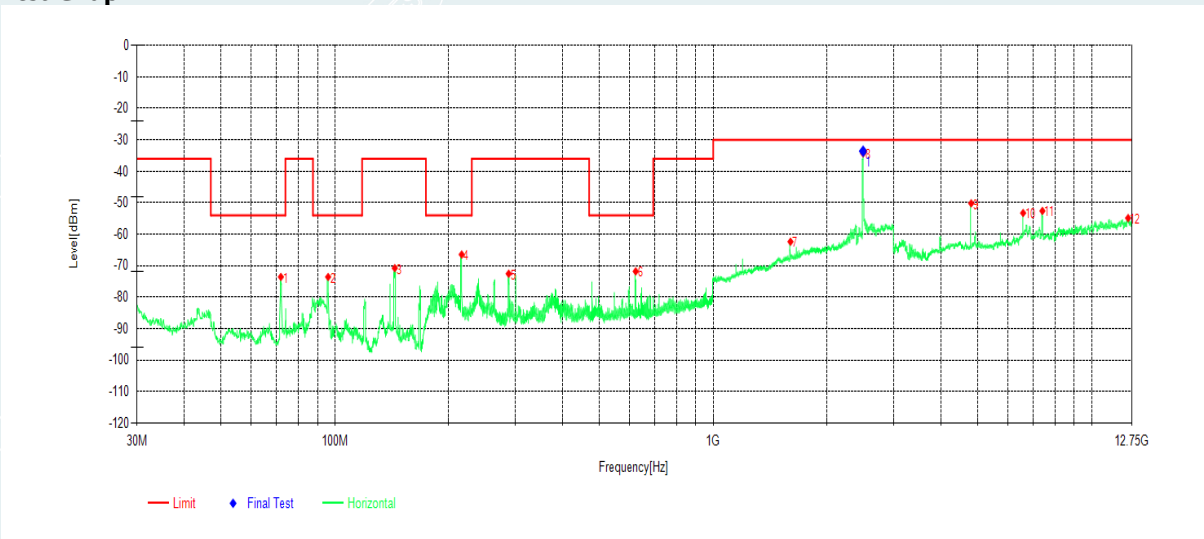
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-48.30	-66.98	-54.00	12.98	-18.68	RMS	Vertical
2	95.96	-53.83	-73.14	-54.00	19.14	-19.31	RMS	Vertical
3	144.654	-55.59	-74.82	-36.00	38.82	-19.23	RMS	Vertical
4	168.031	-55.03	-72.90	-36.00	36.90	-17.87	RMS	Vertical
5	215.658	-49.55	-67.07	-54.00	13.07	-17.52	RMS	Vertical
6	818.028	-71.07	-76.14	-36.00	40.14	-5.07	RMS	Vertical
7	1164	-67.01	-67.70	-30.00	37.70	-0.69	RMS	Vertical
8	1600	-64.51	-59.73	-30.00	29.73	4.78	RMS	Vertical
9	2391	-51.91	-42.24	-30.00	12.24	9.67	RMS	Vertical
10	4806.675	-46.85	-48.59	-30.00	18.59	-1.74	RMS	Vertical
11	6432	-55.84	-53.67	-30.00	23.67	2.17	RMS	Vertical
12	7240.275	-54.57	-49.81	-30.00	19.81	4.76	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph

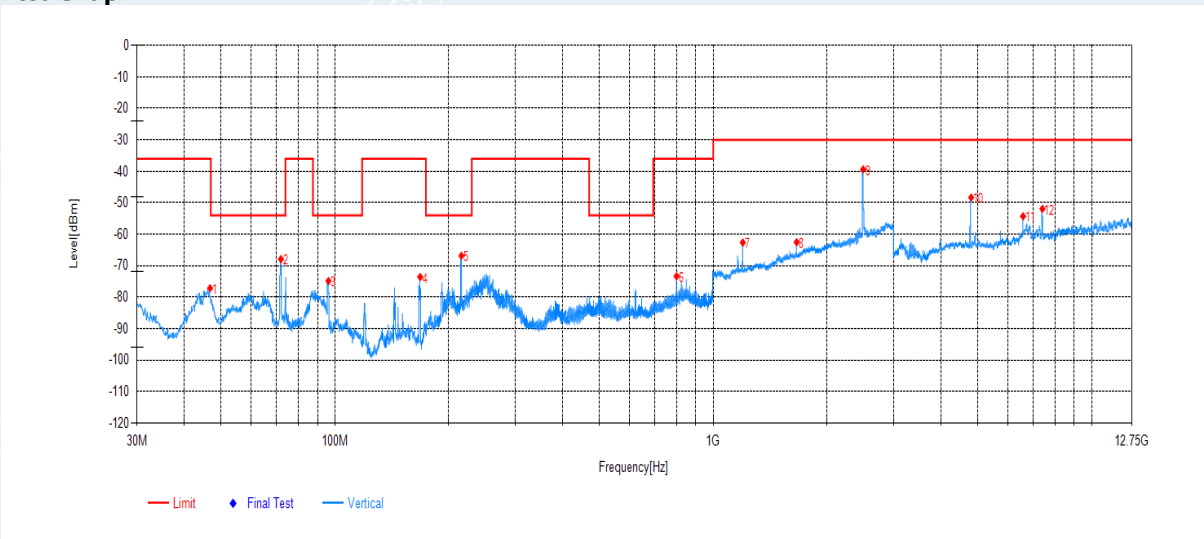


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-51.99	-73.55	-54.00	19.55	-21.56	RMS	Horizontal
2	95.96	-56.71	-73.57	-54.00	19.57	-16.86	RMS	Horizontal
3	143.975	-51.43	-70.76	-36.00	34.76	-19.33	RMS	Horizontal
4	216.337	-49.10	-66.41	-54.00	12.41	-17.31	RMS	Horizontal
5	288.02	-58.37	-72.51	-36.00	36.51	-14.14	RMS	Horizontal
6	624.028	-63.60	-71.77	-54.00	17.77	-8.17	RMS	Horizontal
7	1600.2	-66.74	-62.35	-30.00	32.35	4.39	RMS	Horizontal
8	2490	-46.64	-34.28	-30.00	4.28	12.36	RMS	Horizontal
9	4806.675	-48.20	-50.16	-30.00	20.16	-1.96	RMS	Horizontal
10	6591.9	-56.85	-53.24	-30.00	23.24	3.61	RMS	Horizontal
11	7414.8	-57.55	-52.57	-30.00	22.57	4.98	RMS	Horizontal
12	12488.7	-69.28	-54.86	-30.00	24.86	14.42	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	2490	-45.96	-33.60	-30.00	3.60	12.36	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2472MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

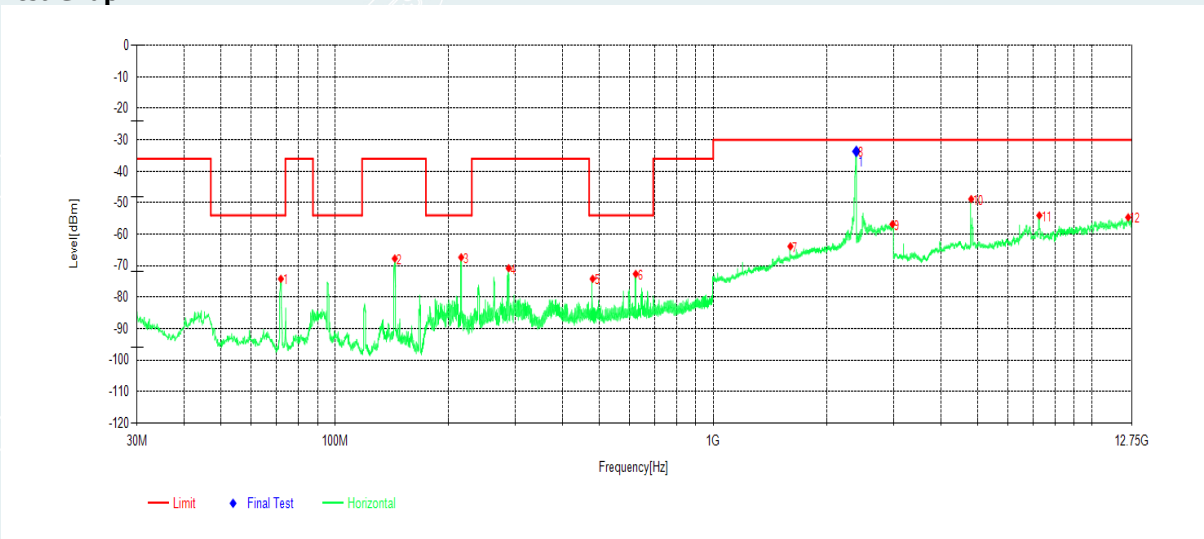
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	46.781	-63.52	-77.12	-36.00	41.12	-13.60	RMS	Vertical
2	72.001	-49.20	-67.88	-54.00	13.88	-18.68	RMS	Vertical
3	96.154	-55.52	-74.82	-54.00	20.82	-19.30	RMS	Vertical
4	168.128	-55.69	-73.56	-36.00	37.56	-17.87	RMS	Vertical
5	216.046	-49.31	-66.83	-54.00	12.83	-17.52	RMS	Vertical
6	799.986	-67.92	-73.33	-36.00	37.33	-5.41	RMS	Vertical
7	1197.2	-62.85	-62.64	-30.00	32.64	0.21	RMS	Vertical
8	1661.2	-67.15	-62.50	-30.00	32.50	4.65	RMS	Vertical
9	2490.2	-51.86	-39.37	-30.00	9.37	12.49	RMS	Vertical
10	4806.675	-46.58	-48.32	-30.00	18.32	-1.74	RMS	Vertical
11	6591.9	-58.21	-54.26	-30.00	24.26	3.95	RMS	Vertical
12	7413.825	-57.00	-51.93	-30.00	21.93	5.07	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT40 2422MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph

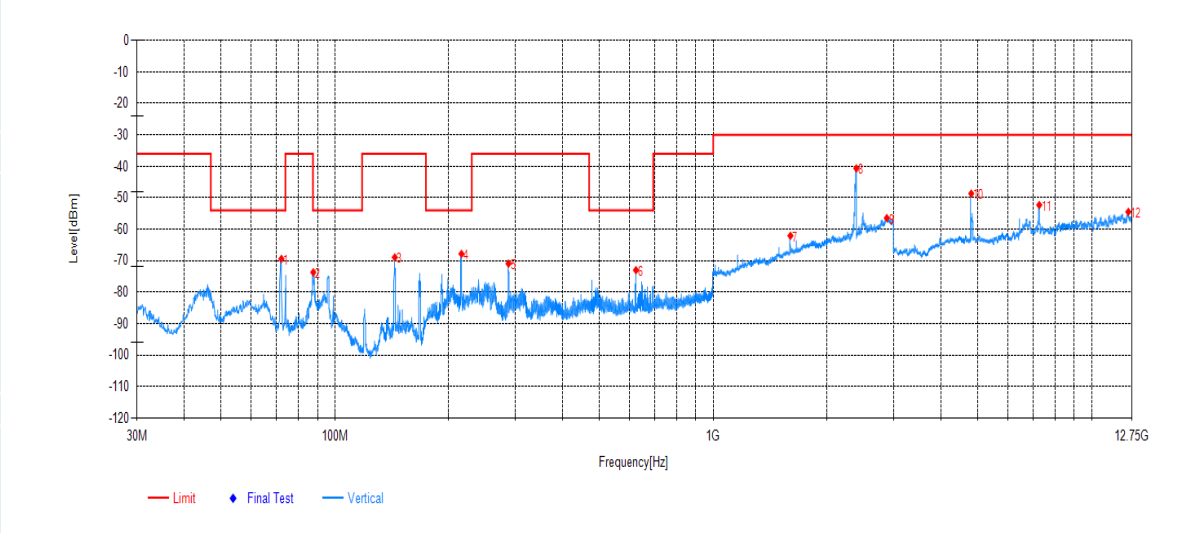


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-52.59	-74.15	-54.00	20.15	-21.56	RMS	Horizontal
2	143.975	-48.39	-67.72	-36.00	31.72	-19.33	RMS	Horizontal
3	215.755	-50.00	-67.33	-54.00	13.33	-17.33	RMS	Horizontal
4	288.02	-56.63	-70.77	-36.00	34.77	-14.14	RMS	Horizontal
5	479.983	-62.83	-74.16	-54.00	20.16	-11.33	RMS	Horizontal
6	624.028	-64.44	-72.61	-54.00	18.61	-8.17	RMS	Horizontal
7	1600.2	-68.25	-63.86	-30.00	33.86	4.39	RMS	Horizontal
8	2389	-43.07	-33.69	-30.00	3.69	9.38	RMS	Horizontal
9	2976.8	-70.22	-56.82	-30.00	26.82	13.40	RMS	Horizontal
10	4806.675	-46.84	-48.80	-30.00	18.80	-1.96	RMS	Horizontal
11	7277.325	-59.71	-54.02	-30.00	24.02	5.69	RMS	Horizontal
12	12495.525	-69.18	-54.61	-30.00	24.61	14.57	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	2389	-43.06	-33.68	-30.00	3.68	9.38	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT40 2422MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

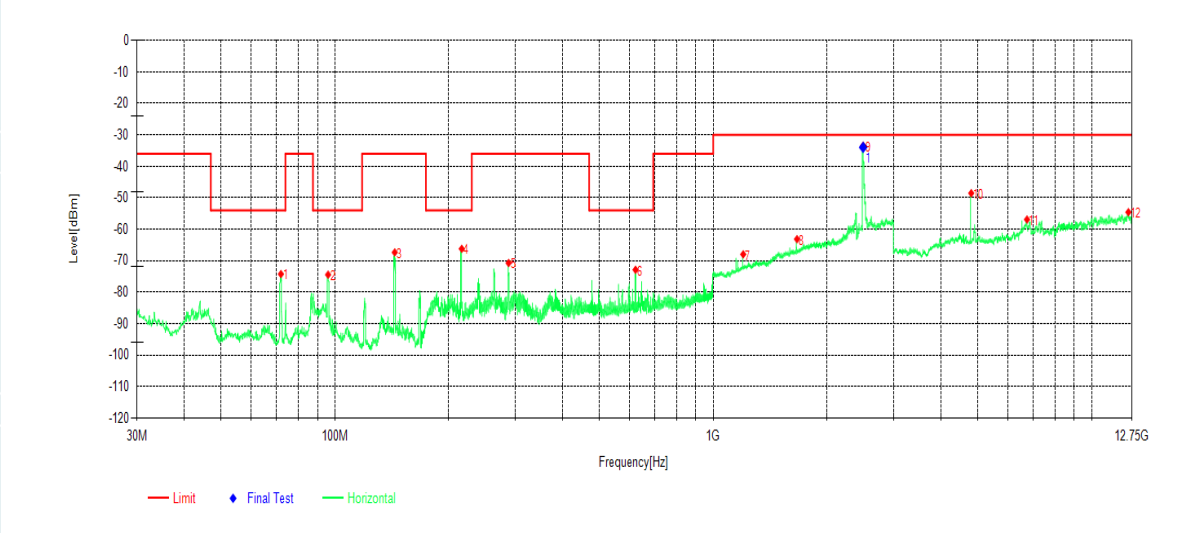
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.195	-50.64	-69.40	-54.00	15.40	-18.76	RMS	Vertical
2	87.715	-53.60	-73.67	-54.00	19.67	-20.07	RMS	Vertical
3	143.975	-49.61	-68.90	-36.00	32.90	-19.29	RMS	Vertical
4	216.046	-50.28	-67.80	-54.00	13.80	-17.52	RMS	Vertical
5	287.632	-56.36	-70.91	-36.00	34.91	-14.55	RMS	Vertical
6	624.998	-64.95	-72.97	-54.00	18.97	-8.02	RMS	Vertical
7	1600	-66.86	-62.08	-30.00	32.08	4.78	RMS	Vertical
8	2388.6	-50.16	-40.62	-30.00	10.62	9.54	RMS	Vertical
9	2875.6	-70.03	-56.43	-30.00	26.43	13.60	RMS	Vertical
10	4806.675	-46.92	-48.66	-30.00	18.66	-1.74	RMS	Vertical
11	7274.4	-57.87	-52.30	-30.00	22.30	5.57	RMS	Vertical
12	12511.125	-69.12	-54.46	-30.00	24.46	14.66	RMS	Vertical

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT40 2462MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph

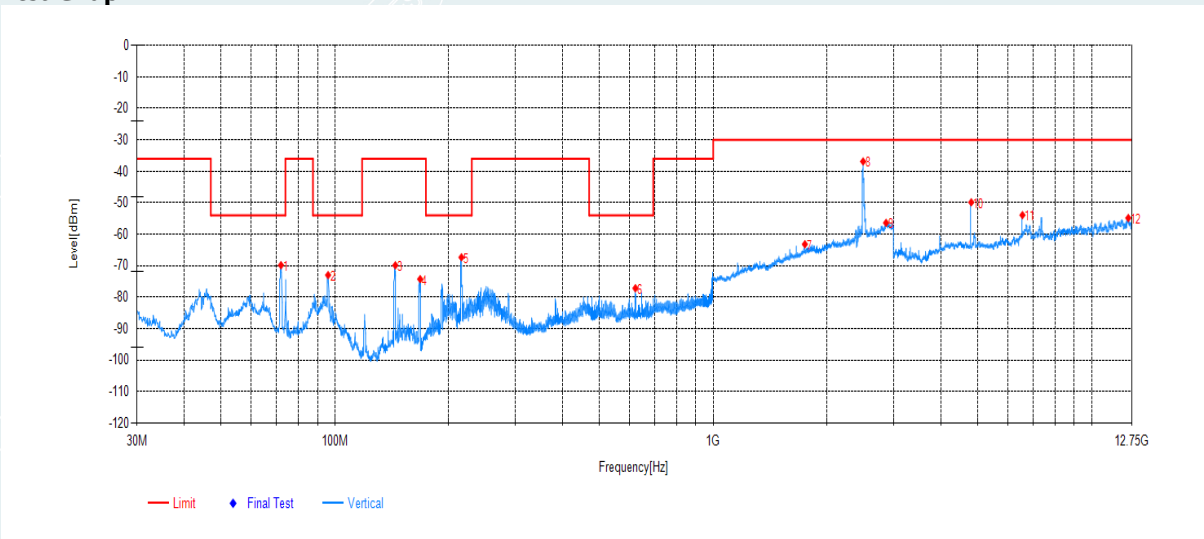


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-52.65	-74.21	-54.00	20.21	-21.56	RMS	Horizontal
2	95.96	-57.56	-74.42	-54.00	20.42	-16.86	RMS	Horizontal
3	143.975	-48.01	-67.34	-36.00	31.34	-19.33	RMS	Horizontal
4	216.337	-48.88	-66.19	-54.00	12.19	-17.31	RMS	Horizontal
5	287.923	-56.57	-70.71	-36.00	34.71	-14.14	RMS	Horizontal
6	623.155	-64.67	-72.87	-54.00	18.87	-8.20	RMS	Horizontal
7	1200.2	-67.73	-67.96	-30.00	37.96	-0.23	RMS	Horizontal
8	1664.6	-67.60	-63.13	-30.00	33.13	4.47	RMS	Horizontal
9	2490	-45.79	-33.43	-30.00	3.43	12.36	RMS	Horizontal
10	4806.675	-46.57	-48.53	-30.00	18.53	-1.96	RMS	Horizontal
11	6748.875	-62.85	-56.91	-30.00	26.91	5.94	RMS	Horizontal
12	12515.025	-68.97	-54.56	-30.00	24.56	14.41	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	2490	-46.32	-33.96	-30.00	3.96	12.36	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT40 2462MHz	Voltage:	AC 230V/50Hz
Environment:	24.2℃/40％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-51.14	-69.82	-54.00	15.82	-18.68	RMS	Vertical
2	95.96	-53.66	-72.97	-54.00	18.97	-19.31	RMS	Vertical
3	144.46	-50.61	-69.86	-36.00	33.86	-19.25	RMS	Vertical
4	168.031	-56.38	-74.25	-36.00	38.25	-17.87	RMS	Vertical
5	216.046	-49.78	-67.30	-54.00	13.30	-17.52	RMS	Vertical
6	622.961	-69.02	-77.14	-54.00	23.14	-8.12	RMS	Vertical
7	1746.6	-69.10	-63.17	-30.00	33.17	5.93	RMS	Vertical
8	2490.6	-49.30	-36.86	-30.00	6.86	12.44	RMS	Vertical
9	2862.4	-69.89	-56.36	-30.00	26.36	13.53	RMS	Vertical
10	4806.675	-48.10	-49.84	-30.00	19.84	-1.74	RMS	Vertical
11	6565.575	-57.37	-53.91	-30.00	23.91	3.46	RMS	Vertical
12	12502.35	-69.68	-54.83	-30.00	24.83	14.85	RMS	Vertical

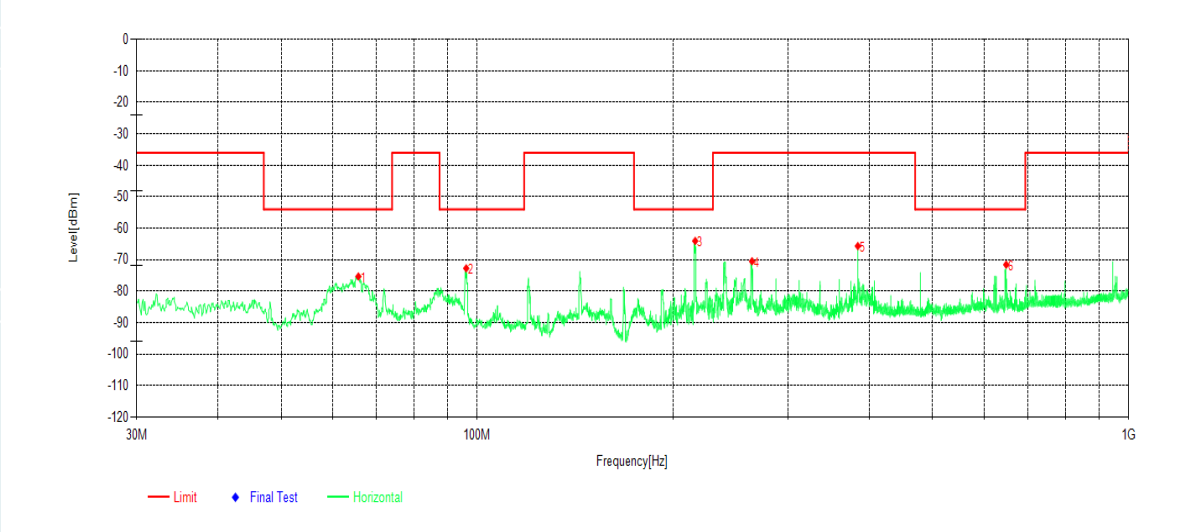
Power supply: AC 230V/50Hz(DC 48V/0.27A power by PoE Adapter)

30MHz-1GHz

Pre-scan all modes and recorded the worst case results(TX 802.11n HT20 2412MHz) in this report.

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.6℃/49％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-24	Remark:	/

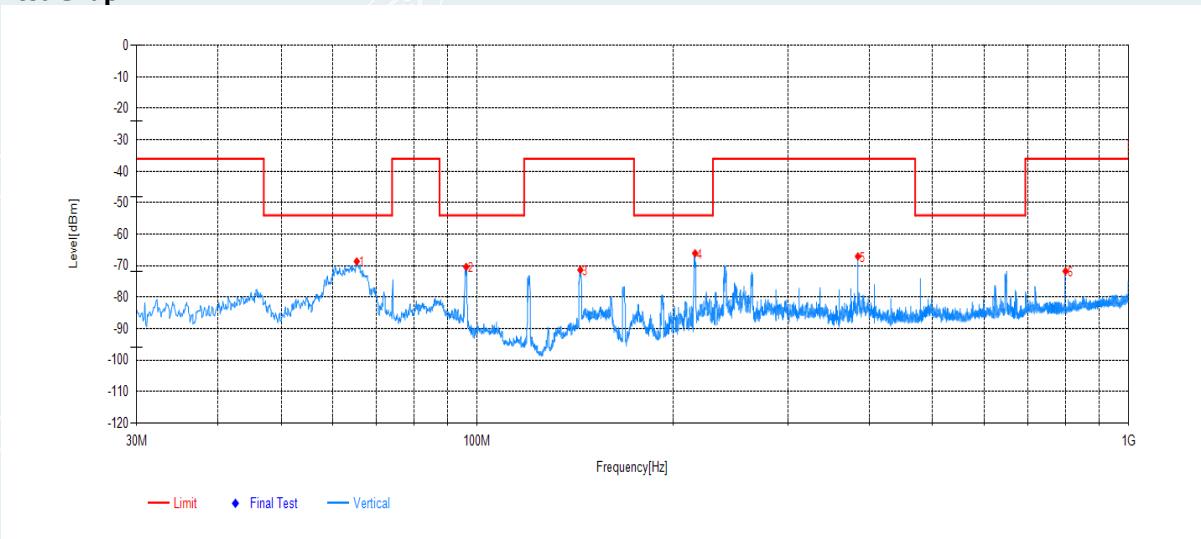
Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	65.696	-55.48	-75.32	-54.00	21.32	-19.84	RMS	Horizontal
2	96.154	-55.85	-72.71	-54.00	18.71	-16.86	RMS	Horizontal
3	216.046	-46.68	-64.00	-54.00	10.00	-17.32	RMS	Horizontal
4	264.061	-55.53	-70.46	-36.00	34.46	-14.93	RMS	Horizontal
5	383.953	-53.71	-65.64	-36.00	29.64	-11.93	RMS	Horizontal
6	648.763	-63.85	-71.55	-54.00	17.55	-7.70	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	TX 802.11n HT20 2412MHz	Voltage:	AC 230V/50Hz
Environment:	24.6℃/49％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-24	Remark:	/

Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	65.308	-53.24	-68.62	-54.00	14.62	-15.38	RMS	Vertical
2	96.154	-51.03	-70.33	-54.00	16.33	-19.30	RMS	Vertical
3	143.975	-52.02	-71.31	-36.00	35.31	-19.29	RMS	Vertical
4	216.046	-48.52	-66.04	-54.00	12.04	-17.52	RMS	Vertical
5	383.953	-54.38	-67.01	-36.00	31.01	-12.63	RMS	Vertical
6	799.986	-66.33	-71.74	-36.00	35.74	-5.41	RMS	Vertical

5.7 RECEIVER SPURIOUS EMISSIONS

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.10

Test Method: ETSI EN300 328 V2.2.2/5.4.10.2.2

5.7.1 LIMIT

The spurious emissions of the receiver shall not exceed the values given in table 3.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or for emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

This device uses Radiated measurement.

Table 3: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

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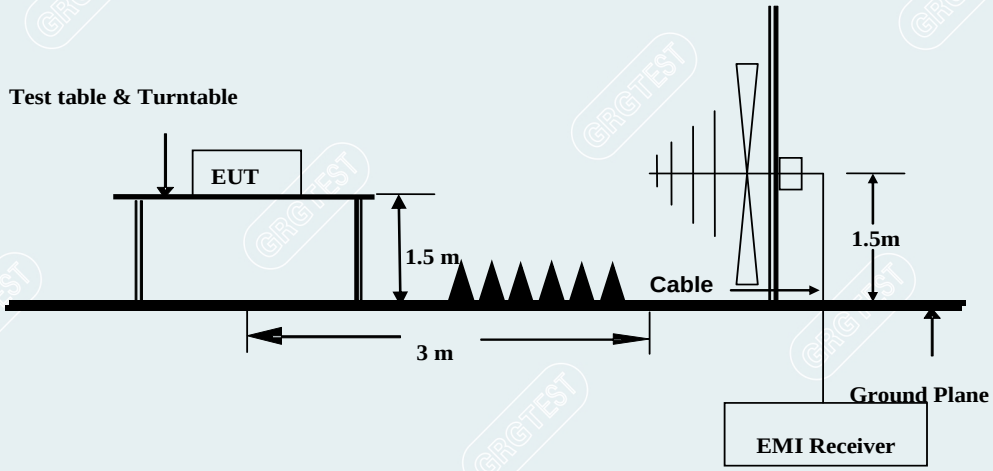
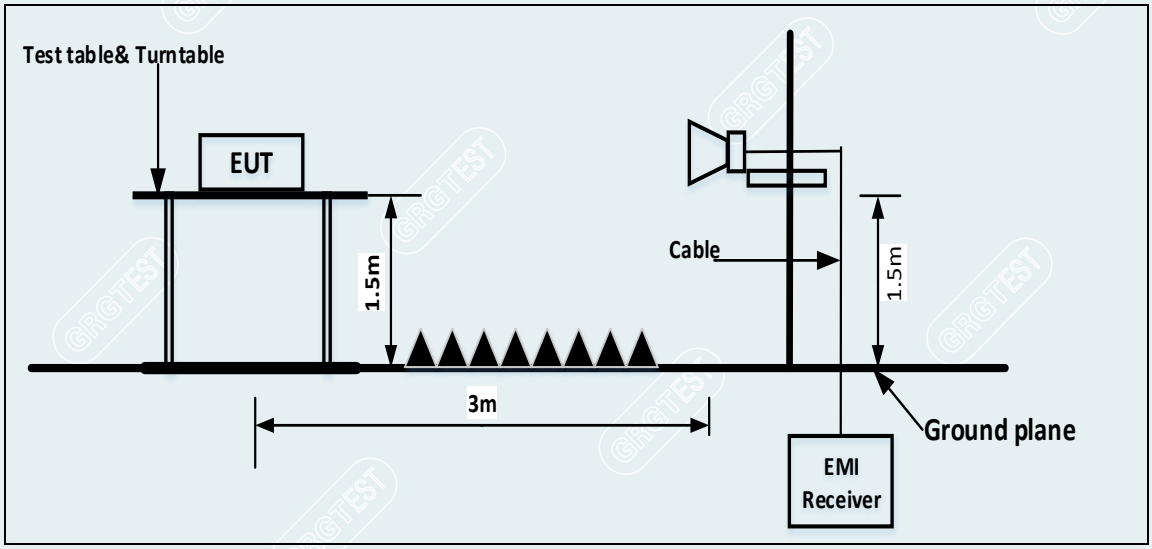
5.7.2 TEST CONFIGURATION

30MHz-1000MHz



1000MHz-12750MHz



5.7.3 TEST PROCEDURES

Test frequency:	2412MHz, 2472MHz for IEEE 802.11b/g/n HT20 2422MHz, 2462MHz for IEEE 802.11n HT40
Test condition:	Normal test conditions.
Test procedure:	Test procedure is according to Clause 5.4.10.2.2 of ETSI EN 300 328 V2.2.2
Remark:	/

5.7.4 DATA SAMPLE

Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
XXX	-58.02	-73.33	-57.00	16.33	-15.31	RMS	Horizontal

Frequency (MHz) = Emission frequency in MHz

Reading (dBm) = Uncorrected Analyzer / Receiver reading

Level (dBm) = Reading (dBm) + Factor (dB)

Limit (dBm) = Limit stated in standard

Margin (dB) = Limit (dBm) – Level (dBm)

RMS = Root Mean Square

---------- The following blanks ----------

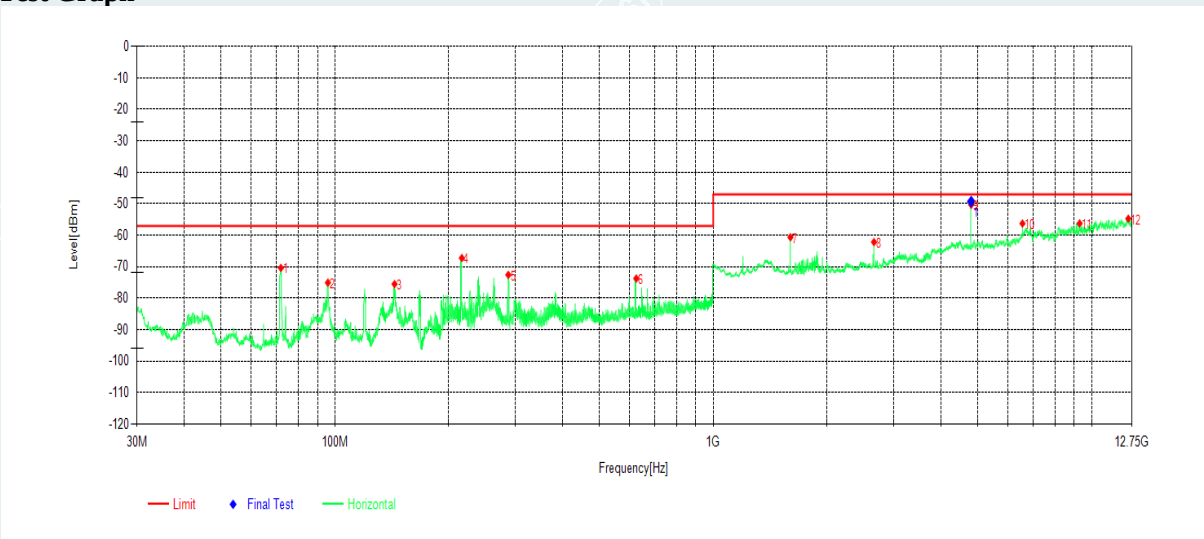
5.7.5 TEST RESULTS

Note: Pre-scan all modes, the worst power supply is AC 230/50Hz(DC 5V/2A power by Adapter) and recorded the worst case results(RX 802.11n HT40 2462MHz) in this report.

Power supply: AC 230V/50Hz (DC 5V/2A power by Adapter)

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	RX 802.11n HT40 2462MHz	Voltage:	AC 230V/50Hz
Environment:	23.8℃/42％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-22	Remark:	/

Test Graph

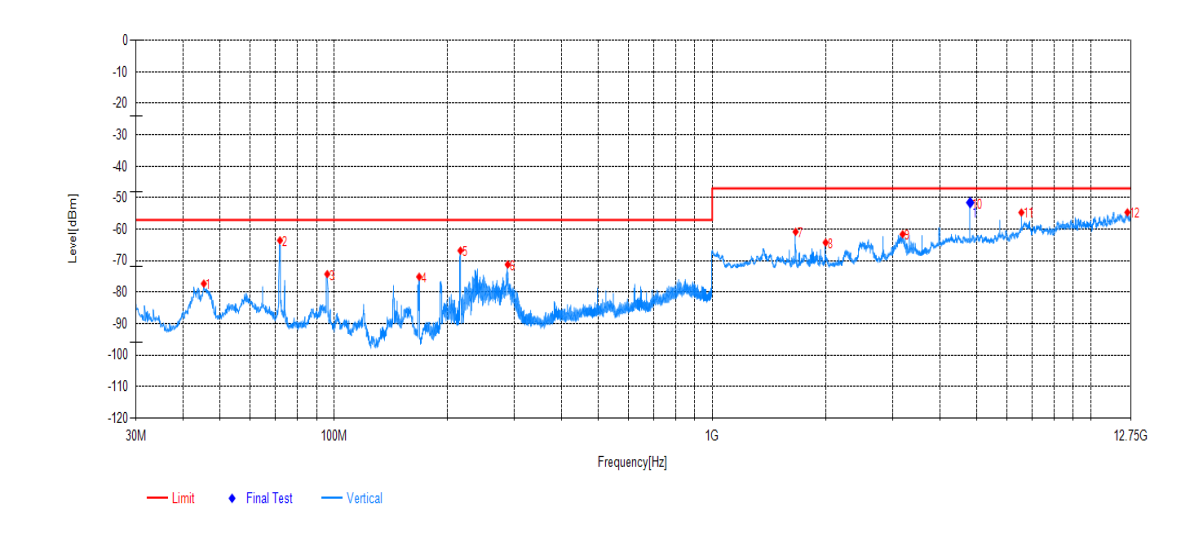


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	72.001	-48.80	-70.36	-57.00	13.36	-21.56	RMS	Horizontal
2	95.863	-58.18	-75.04	-57.00	18.04	-16.86	RMS	Horizontal
3	143.781	-56.22	-75.51	-57.00	18.51	-19.29	RMS	Horizontal
4	216.434	-49.88	-67.19	-57.00	10.19	-17.31	RMS	Horizontal
5	287.438	-58.43	-72.58	-57.00	15.58	-14.15	RMS	Horizontal
6	625.968	-65.57	-73.71	-57.00	16.71	-8.14	RMS	Horizontal
7	1599.25	-47.63	-60.62	-47.00	13.62	-12.99	RMS	Horizontal
8	2659.1	-52.18	-62.16	-47.00	15.16	-9.98	RMS	Horizontal
9	4807	-48.35	-50.29	-47.00	3.29	-1.94	RMS	Horizontal
10	6564.8	-59.53	-56.26	-47.00	9.26	3.27	RMS	Horizontal
11	9297.85	-66.06	-56.22	-47.00	9.22	9.84	RMS	Horizontal
12	12505.6	-69.41	-54.71	-47.00	7.71	14.70	RMS	Horizontal

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	4807	-47.32	-49.26	-47.00	2.26	-1.94	RMS	Horizontal

Project No	E20230331478001	EUT:	Hub M3
Model:	HM-G01E	Sample No:	E20230331478001-0004
Mode:	RX 802.11n HT40 2462MHz	Voltage:	AC 230V/50Hz
Environment:	23.8℃/42％RH/101.0kPa	Engineer:	Gong Xuan
Test Date:	2023-11-20	Remark:	/

Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	45.326	-63.56	-77.25	-57.00	20.25	-13.69	RMS	Vertical
2	72.001	-44.85	-63.53	-57.00	6.53	-18.68	RMS	Vertical
3	96.057	-54.93	-74.24	-57.00	17.24	-19.31	RMS	Vertical
4	168.128	-57.22	-75.09	-57.00	18.09	-17.87	RMS	Vertical
5	216.046	-49.25	-66.77	-57.00	9.77	-17.52	RMS	Vertical
6	288.02	-56.64	-71.18	-57.00	14.18	-14.54	RMS	Vertical
7	1661.525	-48.19	-60.81	-47.00	13.81	-12.62	RMS	Vertical
8	1994.05	-52.75	-64.21	-47.00	17.21	-11.46	RMS	Vertical
9	3185.5	-54.53	-61.57	-47.00	14.57	-7.04	RMS	Vertical
10	4807	-49.91	-51.64	-47.00	4.64	-1.73	RMS	Vertical
11	6564.8	-58.22	-54.67	-47.00	7.67	3.55	RMS	Vertical
12	12511.475	-69.42	-54.63	-47.00	7.63	14.79	RMS	Vertical

Final Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	4807	-49.80	-51.53	-47.00	4.53	-1.73	RMS	Vertical

5.8 RECEIVER BLOCKING

Test Requirement: ETSI EN300 328 V2.2.2/ 4.3.2.11

Test Method: ETSI EN300 328 V2.2.2/5.4.11.2.1

5.8.1 LIMIT

For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

The blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for.

Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking Signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133dBm+10 ×$\log_{10}$(OCBW)) or -68dBm whichever is less (see note 2)	2380 2504	-34	CW
(-139dBm+10 ×$\log_{10}$(OCBW)) or -74dBm whichever is less (see note 3)	2300 2330 2360 2524 2584 2674		
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Receiver Blocking parameters for Receiver Category 2 equipment

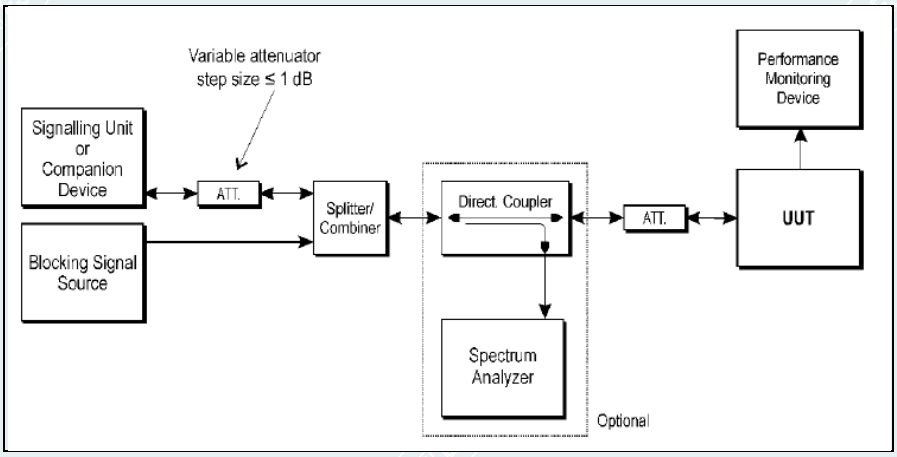
Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking Signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139dBm+10 ×$\log_{10}$(OCBW)+10dBm) or (-74dBm+10dBm) whichever is less (see note 2)	2380 2504 2300 2584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a			

wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Receiver Blocking parameters for Receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking Signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139dBm+10 ×$\log_{10}$(OCBW)+20dBm) or (-74dBm+20dBm) whichever is less (see note 2)	2380 2504 2300 2584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

5.8.2 TEST CONFIGURATION



5.8.3 TEST PROCEDURES

Test condition: Keep the EUT on the lowest and highest channel working mode.

Test procedure:
Test condition:

Step1：
For non-FHSS equipment, the UUT shall be set to the lowest operating channel on which the blocking test has to be performed (see clause 5.4.11.1).
Step 2:
The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to the receiver category and type of equipment.
Step 3:
With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup shown in figure 6.
Unless the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1 is used, the level of the wanted signal shall be set to the value provided in the table corresponding to the receiver category and type of equipment. The test procedure defined in clause 5.4.2, and more in particular clause 5.4.2.2.1.2, can be used to measure the (conducted) level of the wanted signal however no correction shall be made for antenna gain of
the companion device (step 6 in clause 5.4.2.2.1.2 shall be ignored). This level may be measured directly at the output of the companion device and a correction is made for the coupling loss into the UUT. The actual level for the wanted signal shall be recorded in the test report.
•When the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1 is used, the attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the UUT is Pmin. This signal level (Pmin) is increased by the value provided in note 2 of the applicable table corresponding to the receiver category and type of equipment.
Step 4:
The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 are met then proceed to step 6.
Step 5:
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is not met, step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in step 2 has been increased with a value equal to the Occupied Channel Bandwidth except:
- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be increased by 3 dB.
- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still not met, step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in step 2 has been decreased with a value equal to the Occupied Channel Bandwidth except:
- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.
- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be increased by 3 dB.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still

not met, the UUT fails to comply with the Receiver Blocking requirement and step 6 and step 7 are no longer required.
It shall be recorded in the test report whether the shift of blocking frequencies as described in the present step was used.
Step 6:
Repeat step 4 and step 5 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.
Step 7
For non-FHSS equipment, repeat step 2 to step 6 with the UUT operating at the highest operating channel on which the blocking test has to be performed (see clause 5.4.11.1).
Step 8
It shall be assessed and recorded in the test report whether the UUT complies with the Receiver Blocking requirement.
Keep the EUT on the lowest and highest channel working mode.

Remark: If the equipment can be configured to operate with different Nominal Channel Bandwidths (e.g. 20 MHz and 40 MHz) and different data rates, then the combination of the smallest channel bandwidth and the lowest data rate for this channel bandwidth which still allows the equipment to operate as intended shall be used.

Test frequency: 2412MHz, 2472MHz for IEEE 802.11b

---------- The following blanks ----------

5.8.4 TEST RESULTS

Test environment: Normal condition:
26.1℃/51%RH/101.0kPa

Test Engineer: Huang Tianmei

Test Date: 2023-12-06

Test Voltage: DC 5V

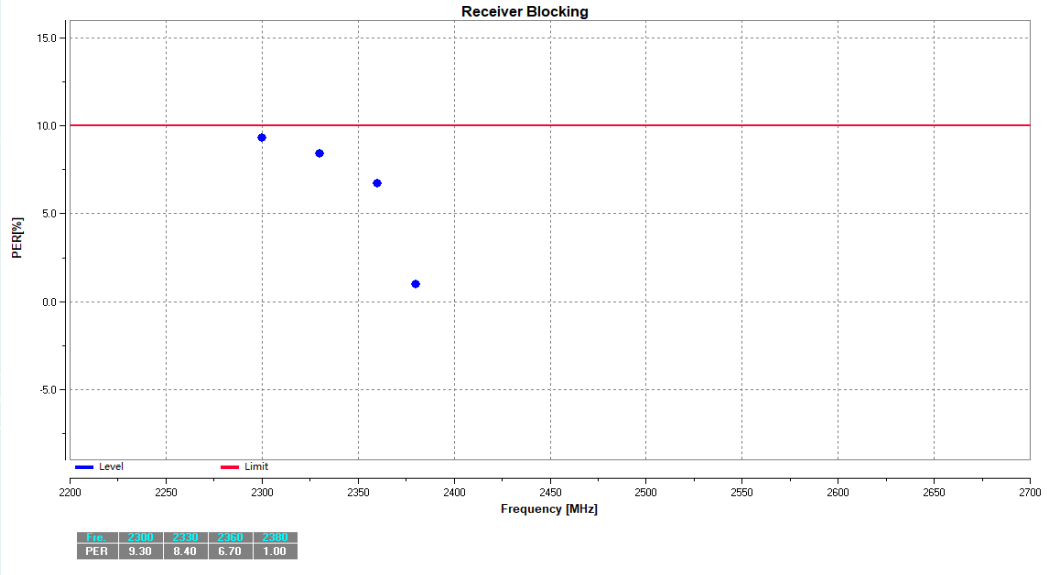
Test Mode	Antenna	Freq [MHz]	Wanted signal [dBm]	Freq. [MHz]	CW [dBm]	PER [%]	Limit [%]	Verdict
802.11b	Ant4	2412	-74	2300	-34	0.10	≤10	PASS
			-74	2330	-34	0.00	≤10	PASS
			-74	2360	-34	0.00	≤10	PASS
			-68	2380	-34	0.00	≤10	PASS
	Ant4	2472	-68	2504	-34	0.90	≤10	PASS
			-74	2524	-34	0.10	≤10	PASS
			-74	2584	-34	1.20	≤10	PASS
			-74	2674	-34	1.20	≤10	PASS

Remark: Ant4:CW=signal power(-34dBm) + Antenna Gain(0dBi).

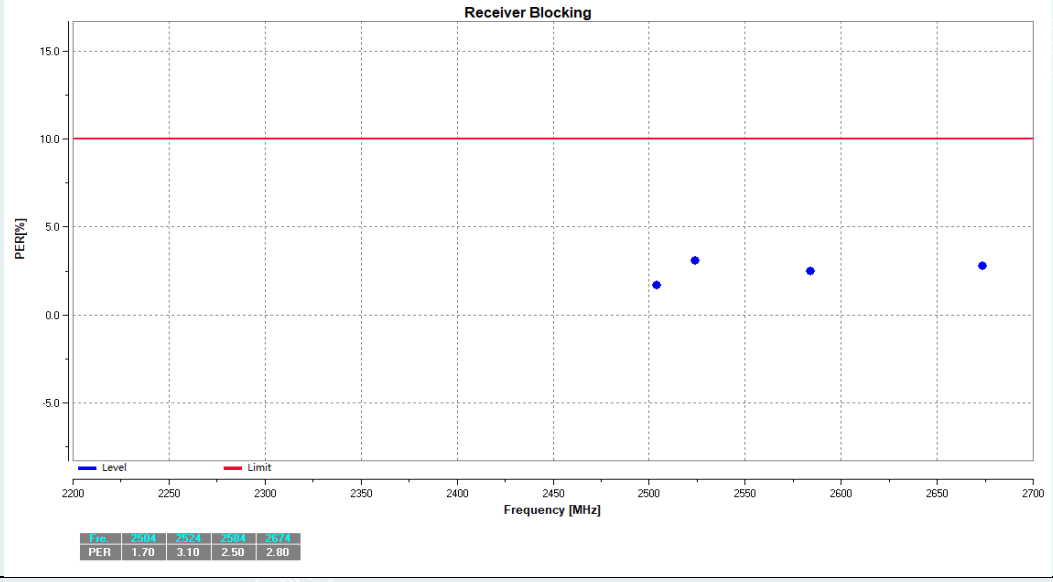
---------- The following blanks ----------

Test Graphs

IEEE 802.11b_Ant4_2412MHz



IEEE 802.11b_Ant4_2472MHz



APPENDIX A: PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

APPENDIX B: PHOTOGRAPH OF THE EUT

Please refer to the attached document E20230331478001-29 EUT photo.

---------- End of Report ----------